COAL AGE

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Two Kinds of Bosses

One Kind Recently the foreman of a certain company found a watchman asleep on duty. He awakened him and asked for an explanation. The man told him that his wife was ill with typhoid fever and he was obliged on account of not being able to employ a nurse to spend most of his hours off duty in that capacity.

The mine foreman immediately investigated the watchman's story and found it true. Personally, he would have been glad to overlook this infraction of the rules and make no report to his superintendent. But knowing that his own job depended on his compliance with strict orders that all such cases must be reported, he sent in his report, explained the circumstances, stated that the watchman's record had been good, and at the risk of incurring official displeasure recommended that the man be laid off for 10 days instead of being discharged.

His superintendent, after reading the report, gave instructions that the watchman be summarily dismissed and ordered a 10-day layoff for the foreman for not discharging the employee when he found him asleep. In explanation of this drastic action he stated that with his concern there could be no excuse for a man asleep on duty, and that without exception such an infraction of the company rules would be followed by certain dismissal.

That's all about Boss No. 1, except that this company paid no real attention to the employment and discharge of its workmen. This was arbitrarily vested in department heads such as this superintendent. The watchman had no regular schedule of duties and carried no watchman's clock to give him a regular round of work. The cost of hiring and firing men, which is more than many concerns seem to realize, was not believed to be a matter worthy of consideration by the management that this boss represented.

The Other Kind At the plant of another company a man was used to check the employees in and out of the works at night. At certain hours but few men passed and during this period the checker found it hard to stay awake with absolutely nothing to do. One night his chief found him taking a nap, but he did not awaken him in order to give the reprimand which he deserved. On the other hand, this boss planned to catch the man asleep again and a few nights later he succeeded in doing so. He did not awaken him on this occasion, but the next day the employee received a curt note of dismissal with refusal to recommend for any other employment. The chief hastened to report the matter, believing that this vigorous action would give him a certain prestige with his superintendent.

But a rather unusual thing happened. The discharged man boldly went to the superintendent to ask for another chance. On securing an interview, he admitted his fault and explained that if he had something to do in the way of clerical work to engage all his time he was sure he could stay awake and make good. The superintendent listened to him with courtesy and sent him back to his chief with this note:

"Please reinstate Mr. X at once. It is true he should not sleep on duty, and I don't believe he will hereafter. Our company will not permit its men to be discharged without first calling their attention to violation of rules and giving them a chance to make good. A man who works at night should be given enough work to keep him busy, and that's up to you. It costs money to hire and fire men and none of us are perfect."

The reinstated employee never knew the contents of that note. His chief would not have shown it to him for worlds. But both were better men as the result of such "bossing."

Ideas and Suggestions

The Human Differential in Mining Operations

It required the invention and development of the automobile to acquaint us with what is now almost a household word—The Differential. The word, after all, is a good deal like the thing itself—it suggests instantly that it has something to do with bridging differences. That, in plain English, is the whole function of any differential.

Its simplest definition stated mechanically—*the obtaining of a certain movement by the difference in two motions in the same direction as a gear operating between one of fifteen and one of sixteen teeth*—makes its purpose instantly clear to even a lay mind. Everyone knows now that the necessary difference in motion in the rear wheels of an automobile must be taken care of—and is—by the differential.

There is a human differential existing and actively at work between Capital and Labor, which are the partners in every business operation. This is especially true of the mining business, where each partner contracts for a share of the profits based directly on the tons of product. Both partners are after the same thing—as much of the profits as each can legitimately secure. That the ethics, or tactics, of either partner has at times proscribed "legitimacy" does not dissolve the partnership. Both are moving in the same direction, but the motion is not always the same; so the use of some differential—humanly speaking—is required.

There must be some way of keeping the partners constantly in touch to accomplish the aim of profitable production and to apportion the profits fairly to Capital as represented by the stockholders; to the Management as represented by operating officials, and to Labor as represented by the workmen. There can be no other differential here than *men*—men in any position, from trapper boy to president.

While the function of the human differential in operating affairs can be performed by the humblest or the highest worker, the best results will come from the recognition of the partnership principle. It is high time that this much was acknowledged by all: That no company can advance its interest by hurting its men and that no body of workers can advance its interest by damaging the business or property of the concern.

It will do great good if both partners in the mining business will give more thought and study to this factor of their operations. Probably its most successful recognition to date is afforded in the work of the industrial constitution put into effect nine months ago by the owners and workmen of the Colorado Fuel and Iron Co. in Colorado. This plan is nothing more than systematized use of men in differential capacities. The same work can be done by any mining concern in less complicated form by the use of "differential" or "mutuality" committees to hear and put in line for adjustment any complaint, grievance or suggestion either as to operating or living conditions. No doubt concerns can be found that have already applied these principles successfully.

The mechanical differential is always found in service at the *point of contact*. Just so with the human differential. Managers, superintendents and foremen of all classes are differential timber. They are the directly accredited representatives of management. If they are unfair, not on the square, curt and unfeeling in their treatment of men, the gears will clash, the teeth will break and there can be no smoothness of motion, if indeed there will be any. Likewise with Labor and its accredited spokesmen. If unfair in demands, disregardful of the ordinary rights of stockholders and management they too will fail in performing their part in harmonizing operations.

We have only touched upon the subject in its broadest, human form: that of mutual human relation and the method of contact. But it will not hurt for any concern or set of men to give hard study to the possibilities of individuals as differentials in the scheme of industrial relation. Each concern will be left to work out the plan in its own way.

This should be remembered: The best brains of able managers will be worthless if transmitted by worthless differentials, and the best thought and aims of honest workmen will be lost if there is no proper human differential to correctly handle such thought and aims. If these human differentials are persistently guarded, the way will be opened for extraordinary accomplishment in the mining and industrial world.

Let Us Co-operate

Are you working for the interests and success of your employer, thereby improving your chances to get ahead, or are you self-centered, playing to the grandstand, bowling over good men of whom you are afraid, and pigeonholing good ideas—not yours—that may be of great value, thereby hindering not only your own personal welfare but your employer's as well?

Do you always say "Yes" to the boss' suggestion and "amen" to his ideas, right or wrong, because by so doing you think you will reap some benefit? And, in another breath, do you discourage and dishearten others, by utter disrespect and unfair treatment?

Do you race to the boss with every daily problem, taking up his more valuable time with your petty affairs, when you could probably settle the matter satisfactorily by council with your brother employees?

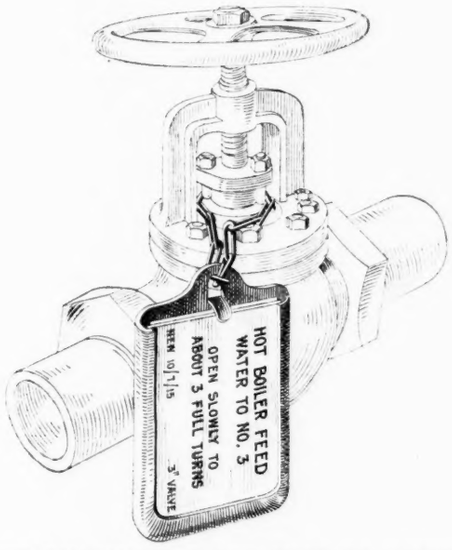
We all like to think the boss is a big man, and that he will readily see those among us who are also strong, not only physically, but mentally and morally as well. The American public respects fair play. It might, for a while, applaud the player who makes a circus catch out of an easy pop-fly; but it will soon get wise to him as one who is playing for personal gain, not caring whether his team wins the pennant, and he will ere long be relegated to the minors. There are such men in every calling, in every company.

Let us all pull together and help win the pennant for our employer. Let us applaud the one who has made a good play and let us not mock and jeer at the one who has made an error.

Let us get that "united we stand" feeling impressed indelibly in our minds, and not get submerged in that "I know it all" manner. One cannot hope to regulate or understand the hearts and minds of men, but they, themselves, could, if they so desired, adjust themselves to conditions and the spirit of affairs, and pull themselves and their employer to success by coöperation.

Identification Tag for Valves

The frequent changes of help in our main plant caused much confusion and resulted in many mistakes in operating valves on the maze of small piping, says M. A. Saller, *Power*, Aug. 1, 1916, so we purchased a lot of



INFORMATION TAG ATTACHED TO VALVE

aluminum tags with protected white writing spaces. These were attached, by light chains, to the bodies of the valves throughout the plant, with an inscription on the tag as to the service of the valve, its size, make, date installed and any special instructions thought necessary.

A Fresh Idea in Government Reports

There will probably be no denial of the statement that spreading technical knowledge is one of the speediest methods of attaining education in matters relating to mining. Even allowing that a lot of the seed falls on unproductive ground, there is always a certain proportion that can be harvested. Education is the only method of preventing waste and loss, and is a factor that makes it easy to understand and carry out reform upon these subjects. This, truly, represents the theory of the subject; but to what extent does the practice coincide with the theory? Largely, it amounts to a problem being solved in a certain way by one country, without the least regard or attention to what is being done on the same problem by any other country.

In connection with this subject, I recently noticed a radical departure from common practice in the case of a Government publication devoted to coal mining—the New South Wales *Government* for the year 1915. In that report the idea was adopted of printing extracts from the British Government inspectors' reports describing new appliances used in underground mining, electrical devices, and kindred subjects. The plan could be advantageously copied by departments having to do with coal mining in other lands.

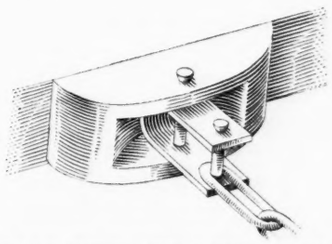
The publication mentioned brings before inspectors, managers and mining men generally special information on appliances that have been tried out and found satisfactory elsewhere.

While New South Wales apparently confines this work to subjects taken from the inspectors' reports of Great Britain, there is no reason why the idea could not be extended. It is certain that it is a new departure and one worthy of serious consideration.

A Handy Clevis

By R. Z. Virgin*

A device that has proved useful in mine haulage consists of a flat clevis that extends out from the locomotive bumper and saves the use of long coupling links. Often, when a locomotive goes in and out of the rooms over curves of short radius, the cars are derailed unless a long coupling is employed. The clevis shown is made of flat iron 4x½ in., with a 1-in. hole for the coupling



A CLEVIS THAT REPLACES LONG COUPLING LINKS

pin. This clevis allows the link to swing sideways, and when carried on the locomotive permits a coupling to be made at either end of the car. It is especially useful where couplings are permanently fastened to one end.

Steam Plants at Many British Collieries are most wasteful. That is the dictum of Sir William Garforth. For instance, with a steam pressure of 60 to 70 lb., boilers improperly covered, imperfect boiler settings allowing large cold-air leakages, hard water forming thick scale, no economizers or feed heaters, boilers hard fired with deficient heating surface, or lightly fired with excessive heating surface, also careless firing—the result is a thermal efficiency of less than 50 per cent. The steam—after passing through long ranges of insufficiently covered pipes—is often used in nonexpansive, noncondensing engines, resulting in a steam consumption of 50 to 100 lb. per i.hp. per hr.

Fire Signal—The United Verde Copper Co. has the following rule for signalling an underground fire: In case of fire, ring nine bells on the electric cage call signal. The engineer on receiving these bells, will flash all electric lights throughout the mine, nine times. This flash will be repeated three times and followed by flashing the station signal on which level the fire is, three different times. Carmen and all others working where there are electric lights will notify those employed in stopes and other places where there are no lights. The trained firemen on the various levels will then take charge of the situation. The first consideration will be for the safety of the men and then for the extinguishing of the fire and protection of property.

*Wheeling Steel and Iron Co., Wheeling, W. Va.

Methods of Mining in the Anthracite Field--III

By H. M. Crankshaw*

SYNOPSIS—The northern anthracite field differs from the others in that the coal measures are thinner and much more nearly flat than in the other regions. Mining machines and "slushing" here find greater general application than elsewhere in the hard-coal field.

In dealing with the problems to be faced in the northern anthracite field, the following facts are encountered:

The working of thin beds must be solved in the near future. Machine mining in connection with longwall or semi-longwall mining, as well as chamber and pillar work, is rapidly coming to the fore and flushing or completely filling the worked-out chambers before commencing to rob pillars is and will be essential in some sections.

Fig. 17 is a typical section through the northern field near Scranton which shows the almost horizontal position of the anthracite beds. It is obviously impossible to work thin beds economically, successfully and thoroughly by any system which entails a large amount of narrow work or dead work.

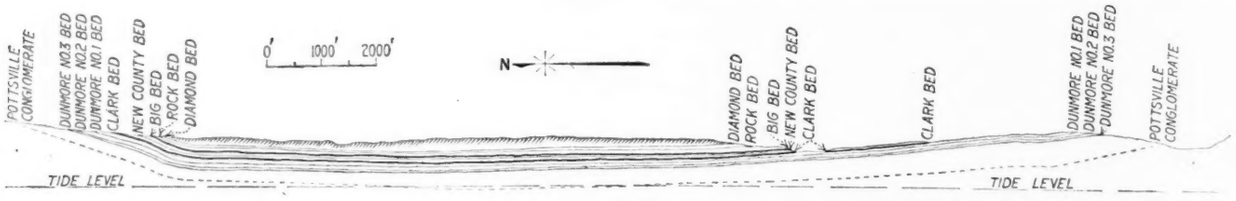


FIG. 17. CROSS-SECTION THROUGH NORTHERN ANTHRACITE FIELD

The methods employed in working thin beds must therefore be confined to some type of longwall which will give as little dead work as possible. Under dead work is included lifting rock for roadways, timbering, etc.

In order to minimize the rock work, it is essential to have as few gateways, roadways or haulageways as possible; and to cut down these passages, it is necessary to use some type of face conveyor.

A longwall face conveyor system (Fig. 18) working in connection with a mining machine is being successfully used in the northern anthracite field. From the main haulageway, a gangway and airway are turned off with 50 ft. center to center and 500 ft. from the previous gangway and airway. The airway is driven 20 ft. wide and no rock is taken up. The gangway is driven 10 ft. wide and 5 ft. of rock is lifted so as to make room for the mine cars. The coal between each pair of gangways is then mined out on a longwall panel system, having a longwall face of 220 ft.

The longwall face is undercut each night by a mining machine. Men follow the machine and drill shot holes in the coal which is then shot down ready for the loaders to load out in the day time.

Each night also, the conveyor is moved the depth of the cut to within handy distance of the coal, the space occupied by the conveyor on the previous day being cogged up with cogs 3 ft. square set every 10 ft.

The conveyor consists simply of an iron trough in which an elevator chain without flights is set in motion by an electric motor situated near the gangway. The miners load the coal into the trough and the elevator chain then delivers it at the gangway where it runs down a short chute into mine cars.

For the purpose of distributing the timber to whatever point along the face it is required, the direction of motion of the chain is reversed, the timber placed in the trough and thus conveyed to the required point.

When it is desired to allow the roof to break or completely settle, the rock taken out of the haulageway should be packed along the side of the roadway as shown in Fig. 18, and lettered *P*. When, however, the use of pack walls is considered, the subject of longwall proper is being approached.

Where the roof and floor are good, this system of conveyors is to be recommended, and in the future beds 2 ft. thick will doubtless be worked by this method. The thinnest bed worked as a commercial success known to the writer was in England where a 15-in. bed, in which another type of conveyor was used, was worked to pay. The bed is known as the Lower Mountain Mine.

In working with a face 220 ft. long as described, on the first entry the left side is worked out advancing and the right side brought back retreating; but on the second entry, the right panel is worked advancing and the left brought back retreating. The system has many advantages and is capable of great expansion. In my opinion, the face conveyor possibly combined with a mining machine is the easiest solution for working coal on the bastard pitches between 10 and 20 deg., especially when the bed is not over 5 ft. thick.

As a typical example of longwall used in England for beds from 4 ft. to 5½ ft. thick, the following is given, since some modification of this method will be used in the northern anthracite field in the not very distant future (see Fig. 19).

Distinct from thinner beds, the rock in this case is ripped down instead of being taken up to make the main haulageways high enough, and the material ripped down is used to build pack walls.

For a bed 4 ft. 6 in. thick the main haulageway would be ripped down so as to give a total height of about 10 ft. before the break occurs, the exact height

*Manager, Harwood Coal Co., Hazleton, Penn.

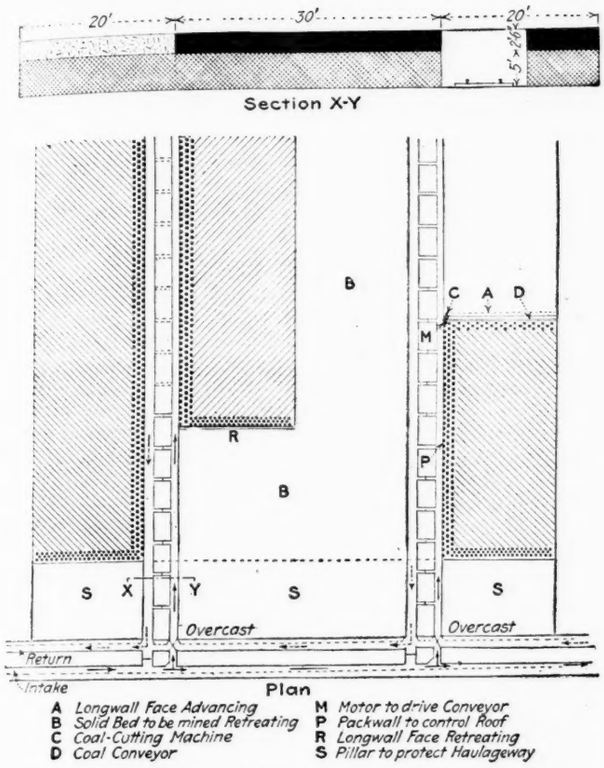


FIG. 18. SEMI-LONGWALL CONVEYOR METHOD OF MINING

being determined by the position of a parting in the roof. The material taken down would be packed on each side of the main haulageway, making pack walls from 25 to 30 ft. wide. The haulage roads are driven 180 ft. apart, and a mine car is used which is small enough to run along the face. Details of the longwall face are shown in Fig. 20.

In addition to the pack walls alongside the gateways, packs are put in along the face about 30 ft. apart, the packs themselves being 9 ft. wide. The pack walls are built of refuse from the bed, refuse from the undercutting (when this is done in clay) and rocks then from the breaking of the roof itself. Between the packs the face is controlled by building a double line of cogs and props, the material used for cogs being oak blocks 8 in. square and 2 ft. 6 in. long. These cogs are set every 8 ft. and are taken out and reset as the face advances. In this way the break is controlled as the roof fractures at the line of cogs.

An important point in setting the cogs is to get the ends flush with each other so that the weight will not key the blocks together. The cogs are removed by hammering out one block; but if too tightly compressed to do this, it will be necessary to dig under one corner of the cog with a pick. The props are set with cap pieces on the top and bottom, or both, depending upon local conditions. The different qualities of the roof in different mines make many problems which must be met as they appear, but good roof and bad, strong roof and weak can be handled by this method when properly followed.

Some years ago I had charge of the experimental work in connection with 11 electrically operated mining machines of three types: chain, disk and bar machines. The disk and bar machines were adapted for longwall only. And since that time almost every type of machine, including pneumo-electric punching machines, have passed through my hands.

One of the advantages of the bar machine is that it can be driven by a squirrel cage motor, using alternating current, so that electrical troubles are minimized. Another advantage of this type of undercutter is that the bar can quickly be swung out of the cut and the picks changed. But the bar machine as a general rule is liable to cut an uneven bottom.

The disk machine is awkward to handle as the disk is fixed, but for cutting in tough shale or clay full of iron pyrite commonly known as ironstone nodules or fire balls, it is strong and effective. The chain machine is the type most commonly known and employed in the anthracite field, and of the various makes in use the one with the most power and strongest mechanical construction gives the best results. The worst feature, especially in a longwall machine, is to be short of power. Every time an under-powered machine strikes a tough spot in the undercutting it is overloaded, with consequent electrical troubles and delays. Electrical efficiency is of secondary consideration as compared to service, and longwall machines should have a 50-hp. motor.

Fig. 21 shows a typical method of working beds 5 to 10 ft. thick which lie practically horizontal. These beds are seldom clean, containing varying quantities of refuse, which in some cases amounts to 50 per cent. of the total bed.

The chambers are turned off on 55-ft. centers, the width of the chamber being 24 ft., which leaves a pillar 31 ft. thick. In the particular bed shown, the total thickness is 7 ft. 4 in., but as there is 2 ft. of slate near the bottom of the bed this slate is only taken up in the main haulageway and airway; so that the thickness of the bed as mined in the chamber is only 4 ft. 6 in.

The main haulageway and airway are driven 20 ft. wide, of which 10 ft. is packed tight with refuse, leaving a final haulageway 10 ft. wide.

When the chambers have been driven the required distance, which varies from 250 to 500 ft., and it is possible to secure a complete extraction, the pillars are brought back from the face as shown in Fig. 21. Where, however, the surface must be supported, enough pillar is left in to act as a roof support, as in this instance no flushing or stowing is being considered for the purpose of roof support.

Fig. 22 is an example of a typical method of working a bed 10 to 18 ft. thick containing a large proportion of refuse. As in the previous method described, the chambers are driven on centers of 55 ft. The modern tendency, however, is to increase the distance between

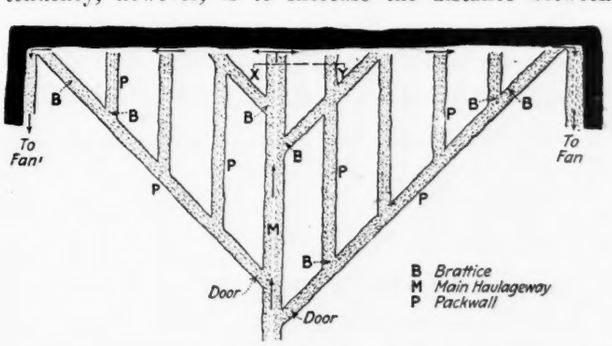


FIG. 19. TYPICAL METHOD OF LONGWALL WORKED ADVANCING

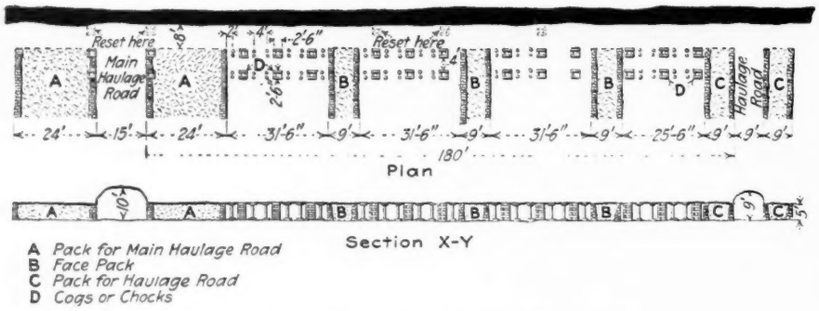


FIG. 20. DETAILS OF A LONGWALL FACE

centers until, in some cases, chambers are driven on centers of 80 ft., the chamber remaining the same size as before, so that in this case there would be a pillar 56 ft. wide. The size of the pillars naturally increases with the depth of the bed from the surface.

When the chambers are being driven up, the refuse from the first mining is packed on the left rib as shown at *B*, Fig. 22.

After the chambers have been driven up the full distance, the miner comes back to the cross heading nearest the face of the chamber, throws over the track and commences to take out the pillar by skipping half the pillar advancing. A timber crib is generally set as shown at *S* and the refuse from the pillar is thrown to the left where it piles up as shown at *D* in what was the original roadway when the chamber was being driven.

After half the pillar has been mined out advancing, the remaining half is brought back on the retreat as shown at *E*, and the refuse from the third and final mining is thrown behind into the goaf. A reserve pillar is left every 10 chambers in case of fire, squeeze or other trouble.

By referring to the section (Fig. 22) taken through the line *X-Y*, a clear idea of the three stages of mining can be obtained. *A* is the original chamber 24 ft. wide. As the chamber is advancing, a row of props is put up, these being about 8 ft. apart and set far enough from the right rib to leave a roadway 10 ft. wide. Along the line of props a dry stone wall is built from the refuse of the bed and behind the wall the rest of the refuse

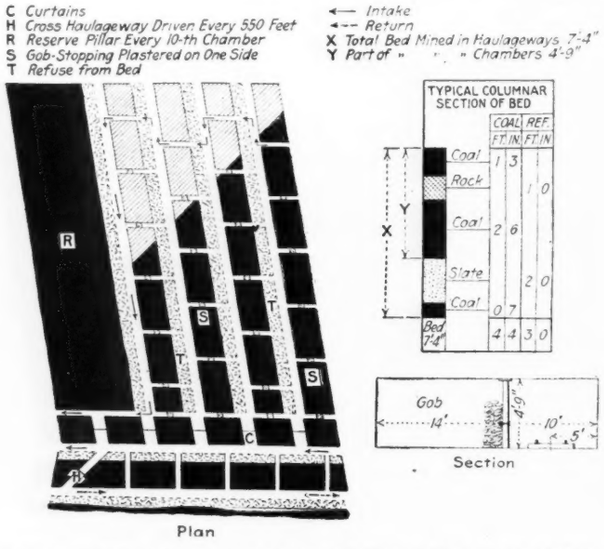


FIG. 21. TYPICAL METHOD OF MINING BEDS 5 TO 10 FT. THICK

is piled up as mined. (See *B* in the section.) The original size of the pillar is shown by *C*. The portion *F* is taken out in the second mining, and the last half of the pillar *E* is removed in the third and final operation. Fig. 23 shows the plan and section of a chamber, giving a clear idea of exactly how the props are put in and the refuse packed. When in the original mining the refuse had been piled on both sides of the chamber (Fig. 24), it is sometimes customary to start at the bottom of the chamber and split the pillar, taking out half the pillar advancing and the second half retreating. Where the roof is strong, it is sometimes possible to do this successfully; but, as a general rule, this method is not recommended, it being much better to move a little refuse and

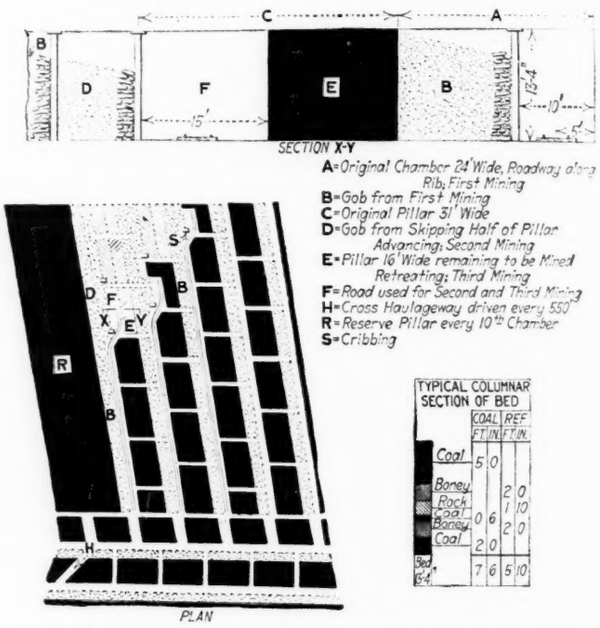


FIG. 22. METHOD OF WORKING BEDS 10 TO 18 FT. THICK

start the work of splitting the pillar from the first cross heading back from the face of the chamber.

It is the use of such methods as the one shown in Fig. 24 which has brought on squeezes which, in some cases, have proved disastrous. It can clearly be seen that when two or three pillars have been taken out, the adjoining pillars, which have been split, are in no position to stand any weight; and consequently, in case of a squeeze, they break down or are over-ridden, especially when the bed is 8 ft. or more in thickness.

In some sections, it is necessary to support the surface or at least to remove the coal so that as little subsidence as possible takes place with no breakage or dislocation of the strata. It is here assumed that the average depths up to 500 ft. prevail.

In complete stowing, it is not possible to extract all the coal and completely fill the goaf with slush or other material so that no subsidence whatsoever will occur. Some settlement must take place, due to the filling material being compressed. The amount of the settlement will, however, naturally depend to some extent on the nature of the material used for filling.

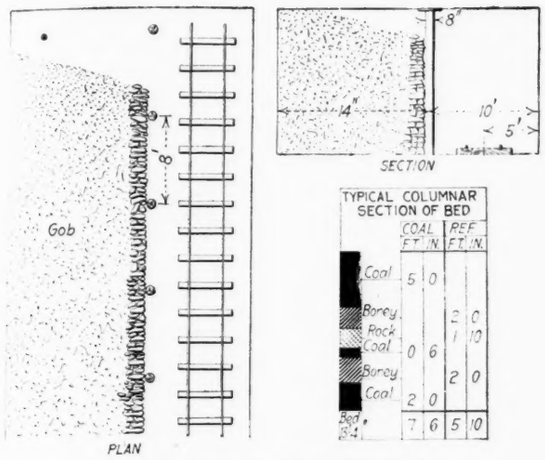


FIG. 23. DETAIL OF A CHAMBER

In average cases, it may be assumed that the settlement will be about 10 per cent. That is to say, a bed 30 ft. thick, when slushed full, will settle about 3 ft. and a bed 10 ft. thick about 1 ft. By slushing full is meant first slushing the chambers and then slushing the goaf as the pillars are removed.

In many cases, in order to extract pillars left in, it will first of all be necessary to fill up the old workings with slush, as the pillars themselves are not strong enough to make a clean break in the roof and relieve the pressure. In other words, where the pillars are weak, an attempt to take them out would only bring on a general squeeze.

It is not likely that enough material will be available to completely fill the whole territory. Consequently, it will be necessary to build barrier pillars of slush which will arrest any squeeze and make a solid area which will serve as a base from which to operate. (See Fig. 25.)

The most convenient form in which to use slushing material is to have the slate, bone, rock, etc., run through a crusher so that everything passes through a 3/8-in. mesh. The solid matter is then mixed with water until the mixture contains about 15 per cent. of solids, when it can be pumped as required. It is not advisable to use large pipes through which to pump slush, since if the mixture is kept moving at a fairly high velocity, there

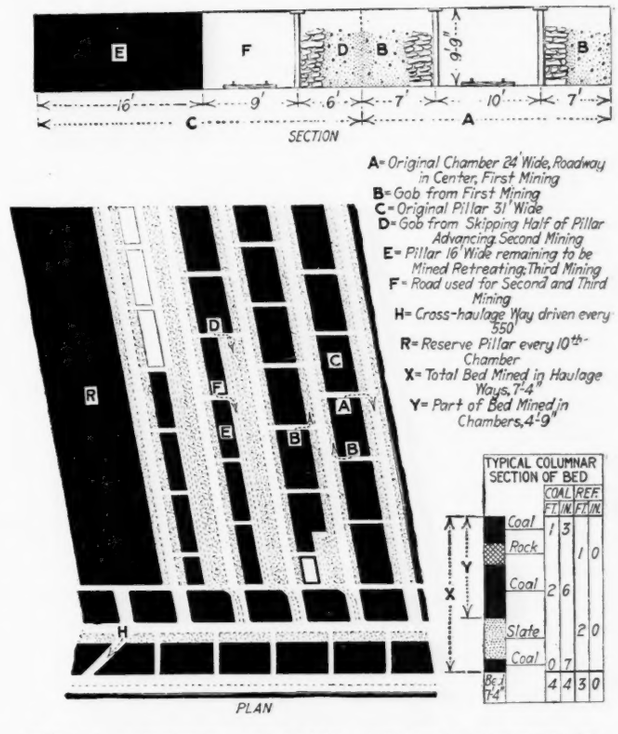


FIG. 24. REMOVING PILLARS. ORIGINAL REFUSE IS PILED ON BOTH SIDES

is little opportunity for any deposit to form which might eventually block the pipes. An 8-in. pipe for use on the surface to the bore hole and a 6-in. pipe inside will give good service.

Before commencing to run slush, it is necessary to pump water for say half an hour; and after finishing the run of slush it is necessary to again pump water—finally draining off the pipes before stopping work. If these precautions are adopted, slush may be run for months without any delays due to the pipes becoming blocked.

In filling an area, in order to form a solid barrier which will prevent a squeeze, it is necessary to make a large barrier pillar, say 500 ft. wide, so that there is no chance for the squeeze to override the pillar. The general method of slushing may therefore be summed up as follows: The slushing material is first of all run through a crusher, then mixed with water and pumped by a surface pump to a tank located over a bore hole. The slush runs down the bore hole and is conveyed inside to whatever part of the mine is being slushed. With a bore hole 400 ft. deep it is possible to run slush 2,000 ft. inside the mine, including any slight up-grades such as rolls. Fig. 25 gives an idea of how a bed 15 ft. thick may be strengthened by slushing so as to prevent any possibility of a squeeze. The slope pillar is first strengthened and made 500 ft. wide. As the thickest coal is on the west side, a barrier pillar 600 ft. wide is put in by filling the chamber with slush. It is then possible to start robbing from the western extremity, and should a squeeze

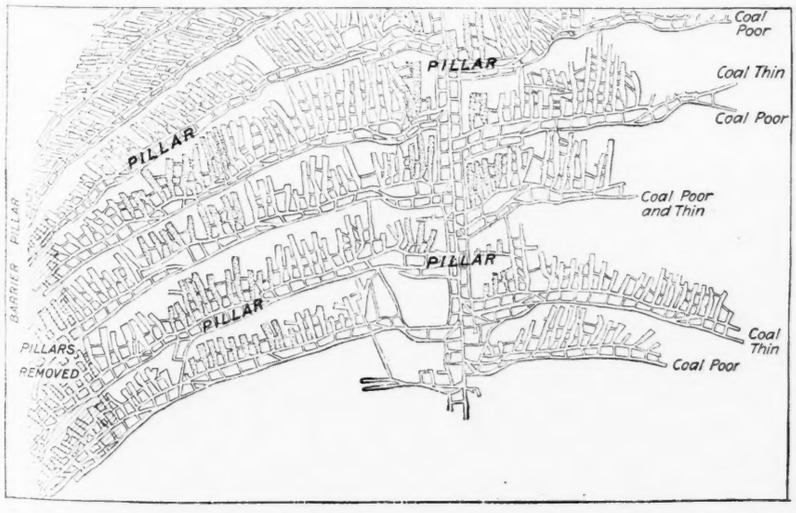


FIG. 25. METHOD OF SLUSHING OLD WORKINGS TO SECURE COMPLETE RECOVERY OF PILLARS

should develop, the slushed area will effectually prevent it from spreading.

It is not possible to lay down hard and fast rules to cover all cases, as much depends on local conditions, character of the roof, etc., and the method of procedure explained by Fig. 25 is only one way of many which can be adopted. Finally, in building batteries to retain the slush, it must be remembered that the most effective battery is one which allows the water to drain off and so prevents from accumulating any pressure due to a hydrostatic head.

In some instances, old burlap held in place by wires strung on props has made effective batteries; and in all cases, the principle of allowing the water to drain off and only retaining the solid matter must be carefully observed.

Recollections of a Manager

When I held the position of superintendent of coal mines I made a practice of granting an interview to any one who requested it. Occasionally I was imposed upon by book agents and specialty salesmen who insisted upon taking up more of my time than I could afford to give, but taken all in all I never had occasion to regret the policy.

When I was promoted to the manager's chair I decided to continue the practice, but soon found it rather exasperating, principally because my city office was so much more accessible than the one I had maintained at the mine.

The aftermath of an adventure with a tramp photographer brought the matter to a head, and from that time on I kept a boy on guard at my office entrance.

The adventure was staged while I was still young enough at the manager's job to experience a thrill of pleasure whenever any one addressed me as manager, or reminded me of the fact that I was manager. Whether the photographer realized my weakness in that respect is more than I can say, but he certainly profited by it. I was seated at my desk dictating the morning's mail when the young man entered unannounced and informed me that he was making a specialty of photographic studies of executives at work in their offices. "Two minutes of your time is all I require," was the way he put it, and without waiting for an answer he proceeded with the necessary preparations to obtain the "study." I glanced at my secretary to see if the request was unusual, but by that time the two minutes were up and the young man was ready to leave.

A week later he came back with a dozen copies of the finished prints, and I was so well pleased with them that I promptly purchased his entire supply; one for my secretary, as the photographer had managed to include her in the picture, and the balance for my own use.

I went personally to an art store to select suitable frames, and after the work was completed sent a copy to each one of my district superintendents; that left two copies; one I took home and the other I caused to be hung over my office desk.

A few days later our president happened into my office and almost the first thing that he noticed was my photograph hanging on the wall. "Well! well!" he began, "are you afraid that we will forget that this is your office when you are not in?"

The following day one of our directors came in and he also promptly noticed the photographic "study." "Oh, ho," he remarked, "so that is the secret of your insight into men's hearts? A man can know nothing of mankind without knowing something of himself."

Within the week two more directors came in to discuss some matters with me, and they also caught sight of the photograph almost immediately. Mr. Drake, who had never taken it upon himself to be downright cordial to me, was moved to speech first, "The proper study of mankind is man," he said.

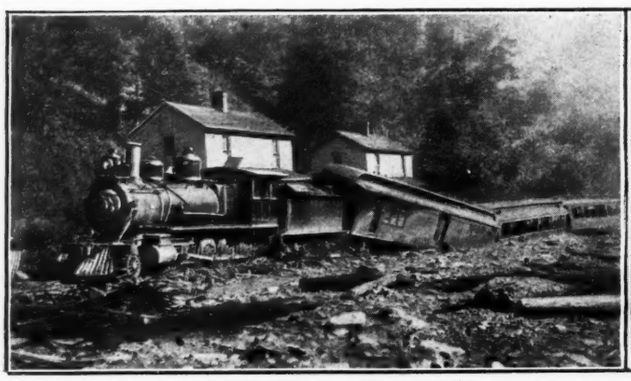
After they had gone my secretary remarked that she felt slighted, since my likeness seemed to absorb all of the attention. A moment later she would have spoken differently. Mrs. Thompson came into the office unannounced. It was her first visit. "Very beautiful," she remarked by way of introduction, looking the while at the photograph, with flashing eyes.

Fortunately, just then one of the directors returned in search of a package that he seemed to have mislaid somewhere, and he remained for quite a chat with Mrs. Thompson.

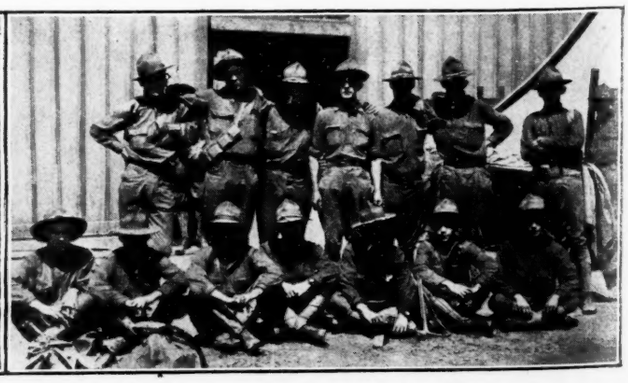
The next day I gave orders to remove all photographs from my office walls.

Cabin Creek Flood Disaster

A local rainfall of terrific intensity swept the Cabin Creek district flooding the Coal River, Cabin Creek and Paint Creek watersheds on Aug. 9. Though it produced terrible results, the United States Weather Bureau recorded no rain on that day in West Virginia at any of its stations.



A CABIN CREEK TRAIN AFTER THE FLOOD



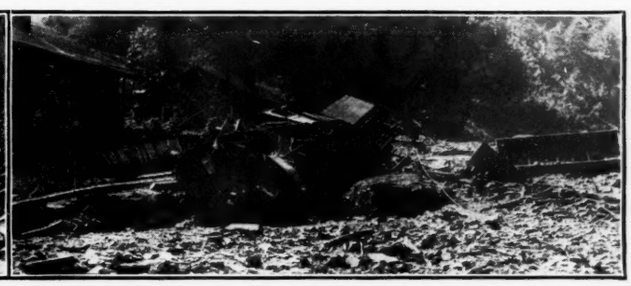
PART OF CO. "B," WEST VIRGINIA NATIONAL GUARD

All the information obtainable is the gaging by a retired mineboss at Kayford who set out his ice-cream freezer and measured the fall as 5.8 in. in 3½ hr. The water was higher on Coal River than elsewhere, but as that watershed is not so closely peopled less damage was done.

The loss of life was quite severe in the valleys affected. Reports are to the effect that 520 houses were washed out on Cabin Creek alone, and the damage to fills and cuts, rolling stock, etc., will probably represent not less than $500,000. It is declared that two-thirds of the Cabin Creek population has deserted the valley, and men are quite scarce.

The flood has damaged almost beyond repair all the bridges and railway embankments. One concrete bridge stood the flood well and is still intact. In many cases

PART OF THE FLOOD WRECKAGE

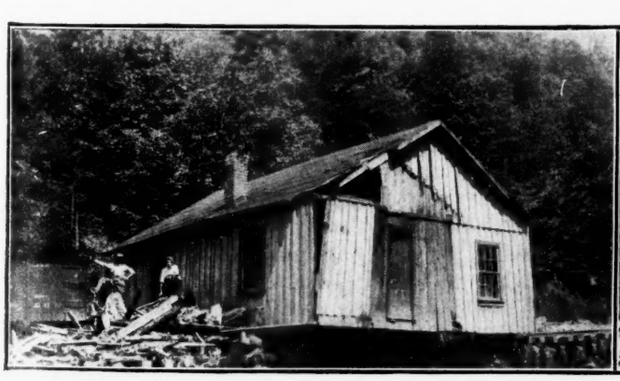


A SHAY LOCOMOTIVE AFTER THE FLOOD

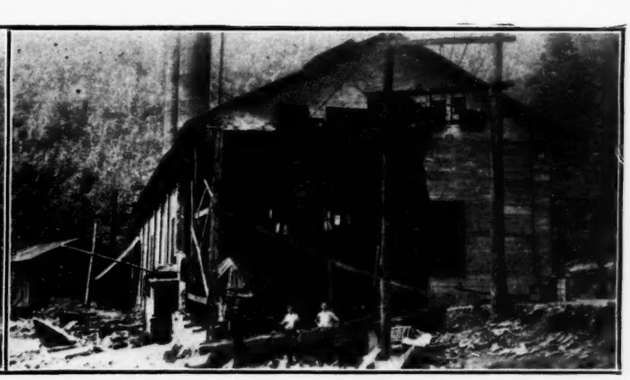
LOCOMOTIVES USED TO HOLD SMALL BRIDGES DURING FLOOD

ESKDALE RAILROAD Y. M. C. A. AFTER CABIN CREEK FLOOD

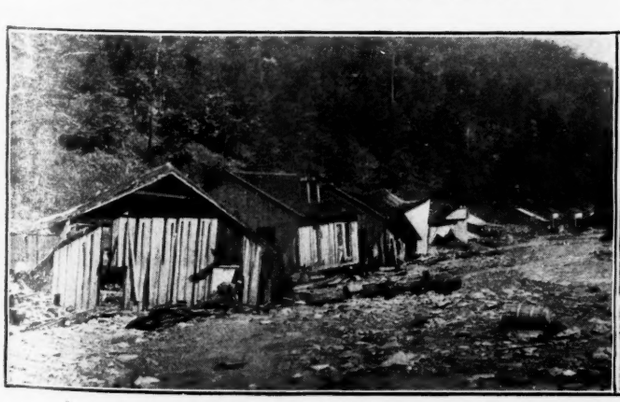
CANE FORK RAILROAD YARD AFTER THE FLOOD



HOUSE FROM CARBON LEFT ON A BRIDGE



POWER HOUSE WRECKED BY THE FLOOD

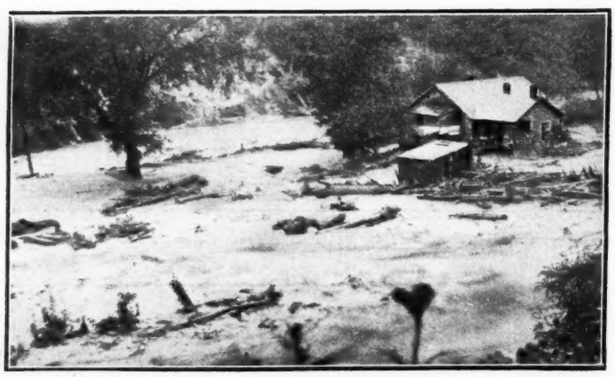


MOST OF THE HOUSES LEFT AT UNITED

STORE AT WEVACO, W. VA., AFTER FLOOD

the creek shifted its bed 100 ft., leaving the bridges high and dry. At Cane Fork a large Mallet compound engine was run onto the bridge at Cane Fork to keep that structure intact and to deflect the water from the machine shops at that place. The shops were thus saved, but as the river broke through and formed a new channel it caused great damage to the town of Eskdale, the water at that point being much higher than it would otherwise have been.

The rain commenced to fall at 5 a.m. and lasted until 10 o'clock that morning, the heaviest rainfall coming at



A CABIN CREEK FLOOD SCENE AT CARBON, W. VA.

about 8:30 a.m. After the flood the militia was called in to care for the suffering, and its work gave universal satisfaction.

Up to Sept. 4 only work trains had managed to reach Decota and Kayford, which are 17 miles from Cabin Creek. Steam shovels and hundreds of men have been at work ever since the flood reëstablishing the roadway, and it is hoped that by Oct. 1 the mines may be running as steadily as before.

Labor Conditions in the Anthracite Region

According to advance statements issued by the United States Geological Survey there were fewer days worked by the employees in the anthracite mines in 1915 than in any year since 1910. The average number of days worked in 1915 was 230 against 245 days in 1914 and 257 days in 1913.

The decrease in the number of days worked as reported to the Geological Survey reflects the unsatisfactory condition of the anthracite industry, which was particularly in evidence during the first seven months of the year. From January to July, inclusive, the shipments of anthracite in 1915 showed a decrease of nearly 2,000,000 tons, while as compared with 1913 the decrease for this period was over 3,800,000 tons. Demand for anthracite was so poor in the first half of 1915 that many of the mines were operated not more than 15 days in a month. In spite of this reduction in output, due to the idle time, stocks in the storage yards accumulated until many of them were filled considerably above their rated capacity. At the beginning of the present season the quantity of coal in storage was variously estimated at from 7,000,000 to 9,000,000 tons, the smaller quantity probably being in excess of any previous record on storage coal.

An entirely different situation exists at the present time, the change being due to two causes. The first of these is that as a result of failure to place orders in the discount months of 1915 (the previous winter was mild and considerable coal remained in consumers' hands), many householders in New England and other northern states found themselves short of fuel in the latter part of the winter of 1915-16. The experience thus gained has developed a widespread intent of being forehanded, and orders for next winter's coal have been so plentiful that not only has the daily production been taken care of but the storage yards have been almost entirely depleted of their reserve stocks.

The second cause of the different situation in 1916 as compared with 1915 is the shortage of labor in the anthracite mines. A conservative estimate places the number of men, chiefly miners' laborers, that have left the anthracite fields, attracted by the higher wages in munition plants and other industries stimulated by the European war, at 20,000. The companies are putting forth every effort to keep their mines working to capacity and to secure a production that will eliminate any danger of a coal famine next winter, but their efforts are largely discounted by the miners who seem to take advantage of every opportunity that offers to throw the mines idle and otherwise cut down the output.

Church feast days and picnics, funerals and weddings, are amply sufficient to justify a holiday, whereas an idleness of ten days at one colliery because the breaker boys objected to the time of day set for paying off, was not resented by the other mine employees. Since June 1 a score or more of "button strikes" have affected about 35,000 men, half of whom lost as much as eleven days' work. Advances in wage rates and shorter working hours may increase the price of coal to the consumer but they do not stimulate the miner to any more earnest effort to supply that consumer's needs.

It is interesting to note that in the year of fewer working days (1915) the average output per man per day showed a gain over 1914 from 1.84 tons to 1.96 tons, while the average for each man for the year was about the same in both years, 450 and 451 tons, respectively. In 1913, the year of largest production in the anthracite region, the average production per man was 466 tons, and the average per day, 1.81 tons. It will be interesting to note, when the returns for the current year are in, to what an extent the increased wages and decreased hours have increased the "intensity of anthracite labor."

Risks Assumed by Mine Employees—An experienced operator of a coal-cutting machine assumed the risk of being injured through a known defect in it where he continued to use it beyond a reasonable time for its repair by the employing operator after repair had been promised, and where he relied upon his ability to use the machine without being injured by it. An employer's promise to repair a defective condition must be the inducement under which an employee remains at work before the employer can be held liable for injury resulting before the repair was made. When repairs are promised, but no time for their making is specified, the employer is entitled to a reasonable time in which to make them. As long as it appears that the employer will probably keep his promise, the employee may remain at work without assuming the risk attendant upon the defective condition, unless the peril is so great that a reasonably prudent employee would not continue work in the face of the danger. But when it becomes plain that the promise is not to be kept, the employee assumes the risk. And to serve as an implied guaranty of safety, the promise of repair must be definite. (Kentucky Court of Appeals, Hamilton vs. Consolidation Coal Co., 186 Southwestern Reporter, 197.)

Annual Outing of the Alabama Coal Operators

By H. S. Geismer*

SYNOPSIS—This year the outing of the Alabama operators was held at Empire. Many interesting papers were presented and were followed by an animated discussion. The chief difficulty was the limited time available for covering the many interesting subjects presented to the convention.

The annual institute meeting and outing of the Alabama Coal Operators' Association was held at Empire, Walker County, Ala., Sept. 16, 1916. Empire is about 30 mi. from Birmingham, and the members of the association were taken out on a special train operated by the "Frisco" R.R., which left Birmingham at 9 o'clock a.m. and arrived at Empire at 10:30 a.m. Returning, the train reached Birmingham at 6 p.m.

From 10:30 a.m. to 12 o'clock noon the officials of the Empire Coal Co. (headed by Walter Moore, the genial president of the company) piloted the visitors around on an inspection of the town, commissary and mines. During the interim music was furnished by the Empire Band. Members of the association who had never been at Empire before were much interested in the combination cotton gin, grist and flour mill that is located there. It is doubtful if such a combination can be found anywhere else in the world operated in connection with a coal mine. The flour mill has a capacity of 25 bbl. per day and the cotton gin handled 260 bales of cotton last year. The explanation for the location of the mill at Empire is that the town is on the north outcrop of the lowest coal bed in the district and just north of the camp is the beginning of a prosperous farming section.

*Keiser-Geismer Engineering Co., Birmingham, Ala.

DRIFT MOUTH AT EMPIRE, SHOWING TYPE OF ROPE HAULAGE EMPLOYED

At noon all visitors assembled at the village church, after which the regular institute program for the day was carried out.

The list of papers and their authors in the order in which they were presented were as follows: "Signs of the Times," Eugene McAuliffe, general coal agent St. Louis & Santa Fe R.R. (the "Frisco"); "Fixing a Fair Tax Assessment Valuation on Mineral Lands and Equalizing the Same," John R. Pill, president of the Birmingham Fuel Co.; "Getting Clean Coal, Inside Practices," Thomas G. Fear, superintendent Bayview mine, Tennessee Coal, Iron and Railroad Co.; "Factors Governing the Efficiency of Steam Plants," Charles E. Bowron, chief engineer Gulf States Steel Co.; "Application of Electricity to Coal Mining in Alabama," C. B. Davis, consulting engineer.

FLOUR AND GRIST MILL AND COTTON GIN

Mr. McAuliffe was not able to attend the meeting, so his paper was read by Priestley Toullmin, president of the Lehigh Coal Co.

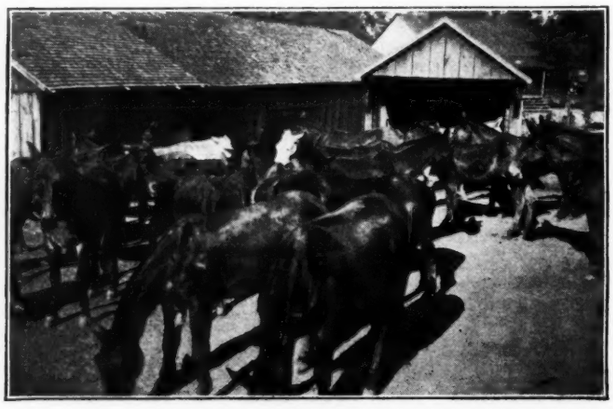
Mr. McAuliffe's paper was not of a nature to prompt discussion, but the second and third papers brought out spirited debates, especially Mr. Pill's paper on taxation. The last two papers might have been more fully discussed but for the feeling that time was up.

Mr. McAulife's paper was a plea for a better understanding between the "sure enough coal men," as he termed them, and the railroads. The railroads, according to McAuliffe's figures, consumed over 24 per cent. of the total coal production of the United States for the year 1915, and the "Frisco" road received nearly 28 per cent. of its revenue freight tonnage for the year ending June 30, 1916, from the commercial coal operators on its line. This should prove that the railroads were vitally interested in the coal operators. Mr. McAuliffe admitted that in the past some railroads had paid for their fuel in part with money and in part with empty coal cars, but such practices have ceased. In concluding he suggested that he was of the opinion that no more mines should be opened until additional markets were reasonably assured.

Mr. Pill in his paper argued for a system of valuing coal lands for purposes of taxation somewhat similar to the system used by the United States Government in putting values on its mineral lands. Four factors should govern values—quality, thickness, accessibility and

thickness of overburden. As a basis he suggested that coal in the ground be given an arbitrary maximum value of, say, 1c. per ton, assuming that the seam was of workable thickness, had 1 ft. of cover, was not over 1 mi. from a railroad and according to analysis gave 15,000 B.t.u. per lb. This value should be reduced as cover increased and heat-unit value decreased.

According to the law as existing in Alabama at present, coal land must be assessed at a fair, reasonable cash

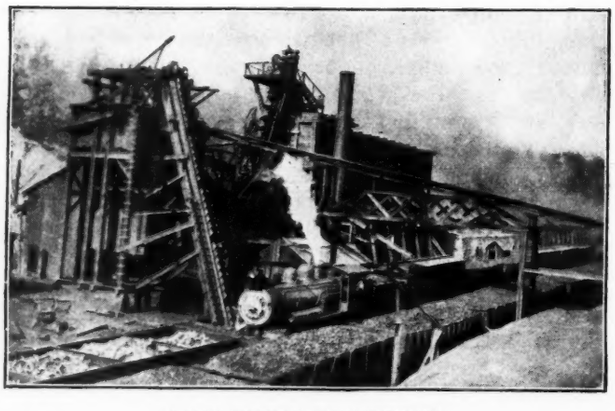


THE MULE CORRAL AT EMPIRE

value, to be estimated at the price which the property would bring at a fair voluntary sale. This law is similar to the Pennsylvania statute.

Several discussed the paper, but no one seemed willing to agree with Mr. Pill entirely, although Jones Moore, general superintendent of the Sloss-Sheffield Steel and Iron Co., congratulated the author for the manner in which the subject was presented. F. C. Marquis, a member of the State Board of Equalizers, suggested that taxing coal tonnage at the tipple had many advocates and would soon be adopted by the State of Kentucky, but his suggestion met the same fate as Mr. Pill's. Frank Nelson, a large taxpayer of the state, cited several instances where the present law had practically resulted in confiscation of some of his property, but had nothing to offer as a substitute. John Bankhead was of the opinion that we might expect about as good results from the present system as from any that had yet been devised, and many present seemed to agree with him.

Mr. Fear in his paper discussed the subject of clean coal from four angles: (1) Natural condition of the seam; (2) human element, labor; (3) method of mining;



THE EMPIRE WASHERY

(4) system of dockage. In discussing the systems of dockage Mr. Fear objected to the practice of deducting a fixed number of pounds of coal from each miner to offset dirty coal loaded the previous day. It was this statement which started the general discussion.

During the discussion Erskine Ramsay gave a description of an automatic sampler that he had designed for one of the mines of the Pratt Consolidated Coal Co. Judging by the questions put to Mr. Ramsay, the dockage question is a live one with Alabama operators.

Mr. Bowron in his paper had in mind some of the simple rules that are overlooked in the operation of mine power plants, and his suggestions for improving the efficiencies of boilers and engines were well received.

Mr. Davis made a rapid-fire review of things electrical around a coal mine. Several of his statements, which would undoubtedly have called forth discussion had time permitted, were as follows:

When the electric locomotive was first placed in the mines it was used largely for gathering purposes. In a general way it took the place of mules, gathering cars from the rooms to the partings where the coal was taken either by tail rope, hoist or endless rope to other partings or to the tipple. As the locomotive was developed and became a more finished machine, the size was increased, and for several years the larger machines were used in connection with the small gathering locomotives to handle larger trips to the main hoist or frequently to the tipple itself. In other words, the larger locomotives, where the grades allowed, made the long haul, runs of two or three or even four miles in length. It is found that a haulage of this kind brings to the tipple cars in large numbers at more or less infrequent periods and thus tends to congest matters; also that it is more expensive to operate and decidedly more destructive to the rolling stock than an endless rope, which operates most favorably on exactly the same grade conditions as the electric haulage. Thus we are gradually coming back to the original idea of using rope haulage on the long hauls and locomotives only for comparatively short hauls at the working faces.

However, when it comes to the main hoist, to be located at the tipple and near the main power plant, it is a question as to whether it is advisable to put in an electric hoist, except under very limited conditions. Generally speaking, where hoists are working on vertical shafts or heavy inclines, peak loads are high, while the average power demand is comparatively low. Consequently it is doubtful if it is advisable to install a plant of sufficient size to meet the peak load, or on the other hand, purchase power to run a large electric hoist because of the important part that the heavy peak load plays in the purchase price of power. But should the main hoist at the tipple be an endless rope, where the load is uniform, it is probable that there are many cases where an analysis of the conditions would show it an advantage to use an electric drive, especially where the power is purchased.

The upkeep on the plunger pump should be less in proportion to first cost than that of the centrifugal pump during a period of operation of, say 10 years.

The meeting was a success from every standpoint. The weather was ideal, the attendance was large, the papers were interesting and the barbecue excellent.

British Export Trade Is Quite Largely Aided by the fact that Great Britain being a large importer of bulky products which are conveyed in small steamers, coal exporters can always rely on an abundant supply of handy-size boats to carry cargoes of coal to small ports devoid of large storage facilities. The coal trade is the regulator of the British shipping industry, for the enormous weight of coal exported furnishes employment to all the tonnage that finds itself disengaged in Northwestern Europe, and it is common knowledge that foreign steamers always take care of a very large part of British coal exports. Owing to the requisitioning of so large a number of British vessels coal exporters from the United Kingdom have had to depend more and more upon foreign shipping, which, under the present war conditions, is rapidly increasing its hold on the trade and even now far outnumbers the British vessels employed. A monthly return just published shows that during the month of January by far the larger number of vessels engaged in the British coal-carrying trade were sailing under foreign flags.— Shipping Illustrated."

Factors Governing the Efficiency of Steam Plants*

By Charles E. Bowron

SYNOPSIS—A résumé of many of the considerations that govern the efficiency of steam plants. Most of the preventable wastes, of course, occur in the boiler room, since the efficient operation of engines, turbines, etc., is largely a question of design and the proper setting of valves.

I will briefly discuss some of the factors governing the efficiency of steam power plants. My remarks apply equally to the steam plants at your mines and to those of your customers.

The efficiency of a steam plant is dependent first upon its correct location and proper design and next upon its proper management. Under the question of design comes the determination of the most economical sizes and kinds of units, boilers, engines, and their auxiliaries, buildings, etc. I will touch upon this subject only incidentally and confine my remarks principally to the matter of operation and management.

The subject falls naturally under two heads: First, the efficient production of steam and second, its efficient utilization. The steam boiler is thus a starting point.

A boiler, 100 per cent. efficient, would transfer the entire heat from completely burned fuel outside the boiler to the water inside of it. What may reasonably be expected in this regard and how may boiler performance be measured? The quantity unit of heat is the British thermal unit, or B.t.u., this being the amount of heat required to raise the temperature of one pound of water 1 deg. F. It requires 970.4 B.t.u. to convert 1 lb. of water at 212 deg. F. into steam of the same temperature. Coal is also rated in B.t.u., and if we assume that it contains 14,000 B.t.u. per lb., it is evident that 1 lb. of coal, with 100 per cent. efficiency, should evaporate $14,000 \div 970.4 = 14.4$ lb. of water.

This then is the bullseye at which to aim. How near can we come to hitting it? Numerous test runs of modern boiler plants have shown an evaporation up to 12 lb. of water per pound of coal, attaining an efficiency of about 80 per cent. This figure cannot be reached by the average plant under ordinary operating conditions, but an efficiency of 70 to 75 per cent. is not out of reach. The average efficiency of boiler plants is, say from 50 to 60 per cent., leaving quite a margin for improvement.

How can we ascertain how much water our own boiler plant is evaporating? We must first keep an accurate record of the coal burned per day, week or month, and this is usually known or can be determined. The amount of water evaporated during the same period must also be known. With these figures in hand, we are in position to find out and to note any improvement or deterioration in boiler practice.

How can we measure the quantity of feed water? The best way is with a meter, either a Venturi tube or a V-notch, with recording apparatus. This is however rather expensive for the average plant, and I would suggest as a substitute an inexpensive revolution counter attached to the boiler feed pump which figured against the theoretical capacity of the pump will give comparative figures. By testing the pump and using its actual capacity figure, a close approximation may be secured. A test of the pump is easily made by counting the number of revolutions, or strokes, required to fill a barrel or tank of known capacity.

A simple division of the quantity of water evaporated by the weight of coal used will give the evaporation. To make a comparison with the theoretical evaporation, which is always figured from water at 212 deg. F. into steam at the same temperature—that is, at atmospheric pressure only—it is necessary to apply a factor to allow for the additional heat consumed in raising the feed water to the temperature maintained in the boiler and evaporating it at that temperature. However, since a uniform steam pressure is maintained, it is not necessary to apply this factor when only making a comparison between results obtained over similar periods of time. Absolute performance is of less interest than comparative performance from month to month.

Improving the Boiler Efficiency

What can now be done to improve boiler efficiency? The purchaser has no control over the design of the boilers themselves, but these should certainly be of good material and workmanship and sufficient in number and capacity to give the best results. He has, however, usually more or less option and control as regards the setting, the size and construction of flues, breeching and stack, the kind of grates, the condition and temperature of feed water, the size of fuel (if not the kind) and the method of firing and controlling the air supply, all of which are important factors.

There are certain losses at boilers which cannot be avoided. These are (1) heat lost in evaporating the natural moisture in the coal to steam, (2) heat lost by being carried away in the moisture formed by the burning of hydrogen in the coal and (3) heat lost by being carried away by the dry chimney gases. The temperature of steam at 140 lb. gage pressure is about 361 deg. F., and the gases leaving the boiler must of course be hotter than the steam or the boiler itself. The temperature of stack gases will run from about 500 to 700 deg. F. The first two losses are unavoidable; the third may be largely increased through excess air supply. Other losses which can be minimized are those arising from unburned carbon in the ash, from incomplete combustion of carbon to carbon monoxide, from the volatile hydrocarbons and from radiation.

Relative to boiler settings, the best practice calls for an airtight outside wall with an independent firebrick lining and the boilers suspended independently of the walls. There are insulating brick now on the market which replace part of the firebrick lining and are claimed to materially reduce the loss from radiation. Exposed boiler tops, or drums, should be covered with mineral wool, asbestos or magnesia suitably protected rather than

*Paper read at the annual outing of the Alabama Coal Operators' Association.

with brick as is ordinarily done. Are the settings air-tight and in good order? If not, it may be well to reset the boilers. Are there any leaks in the connections of the breeching to boilers or stacks? If so, they are cutting down the boiler capacity. Is the stack of sufficient size to develop the boiler capacity? Convenient stack tables may be found in many handbooks.

If coal is being lost through the grates or in the ash, a change in grates may be advisable.

The boiler feed water should be at a temperature not less than 200 deg. F. when entering the boiler. The heater should be provided with a thermometer to check this. If it is not this hot, the heater is too small, or the amount of exhaust steam used is inadequate. This can usually be remedied. The boilers are of course blown off every day to get rid of mud and scale which is not deposited in the heater. If, in spite of this, there is anything more than a film of scale on the tubes, this is a source of loss, and it will cost nothing to find out the cost of a water-treatment plant. If it is desired to use a boiler compound, by all means have one formulated by a competent chemist to suit the particular case in hand in preference to using unknown remedies.

The Method of Firing Is Important

It is in the matter of firing and air supply that the greatest opportunity for saving occurs at the average steam plant. Hand firing is hard and disagreeable work, and it is only human nature to do it in the easiest way, which unfortunately is not the best way. What constitutes good firing? Is it putting on a uniform quantity of coal at uniform intervals? It is not, unless the quantity put on is the correct quantity, unless the interval is the correct interval, and further, unless it is put on in the right way. What is the right way? Consider what happens when there is a bed of red-hot coke on the grates working at the best efficiency. The door is opened and a mass of fresh coal is piled all over the fire bed; the fine coal tends to fill and choke the air passages through the incandescent fuel; the moisture is first driven out of the fresh coal and evaporated into steam, producing a cooling effect; next the volatile matter is driven off and is often only partly burned, as a glance at almost any smokestack when coal is being fired will evidence. Later, with the moisture and volatile matter expelled, air passages burn through and combustion is again normal and efficient. These air passages next burn out to larger size, admitting excess air, thereby lowering the temperature of the furnace.

The remedy for these conditions is evidently to fire comparatively small quantities at short intervals, and to disturb the fire bed as little as possible. It is of material assistance if the furnace can be fired alternately, first on one side and then on the other. This assures a continuous full air supply.

In a practical way it is incumbent upon each plant to secure the best results under its own peculiar conditions. Intelligent experimenting should be followed until such results are secured and thoroughly proved by comparative records.

The increasing popularity of automatic stokers is not due to any saving in labor, but to the fact that they generally save fuel over hand firing to the extent of perhaps 5 to 10 per cent. This is accomplished by feeding it continuously and burning it more completely. Stokers are also susceptible of close regulation in accordance with steam demand and more easily permit of overloading the boiler.

Regarding the matter of air supply, if coal were pure carbon, it would produce about 14,544 B.t.u. per lb. if completely burned to carbon dioxide, or CO_2, but only 4,414 B.t.u. per lb. if burned to carbon monoxide, or CO. Thus any deficiency in air supply is the cause of a serious loss. The average plant errs on the other side. The only reason for an excess air supply is to insure a sufficiency, offsetting imperfect mixing of air and gases in the furnace.

The air supply can be regulated at the point of admission, or the ash-pit doors, and experiment will determine the exact opening of these doors which will burn the least coal and keep up steam. The accurate way to check up combustion conditions is flue-gas analysis, but this is possibly too expensive and elaborate for the average coal-mining plant. It is of interest perhaps to note that with the minimum theoretical air supply, with perfect combustion and with a 500 deg. F. stack temperature, the percentage of CO_2 in the stack gas would be 21, by volume, and that the loss of heat to the stack would be about 10 per cent., while with 100 per cent. excess air the corresponding figures would be 10 per cent. and 20 per cent., showing double the loss.

Boiler Horsepower Is Arbitrary

How much water should a boiler be able to evaporate? A boiler horsepower is a purely arbitrary quantity and is the evaporation of 34.5 lb. of water per hour from and at 212 deg. F., or the equivalent of 33,479 B.t.u. It is considered that 10 sq.ft. of heating surface should produce one boiler horsepower, or 1 sq.ft. should evaporate 3.45 lb. of water per hour. With the aid of evaporation records, the capacity at which the boilers are being operated may be readily determined.

The amount of heating surface referred to is a nominal figure only, and with sufficient grate surface and draft more coal may be burned and up to 200 per cent., or more, of the nominal capacity secured with only a trifling loss in efficiency, particularly if water-tube boilers and automatic stokers are employed.

The term boiler horsepower should not be confused with the ordinary or mechanical horsepower, which as is well known is the equivalent of lifting 33,000 lb. one foot high per minute, and also equal to 2,545 B.t.u. per hr. Thus the boiler horsepower is the equivalent of 13 mechanical horsepower.

As a safety precaution all boilers should have automatic nonreturn stop valves, also double blowoff valves.

Steam Pipes Should Be of Ample Size

We now pass from boilers to engines by way of steam pipes. I will only mention that these pipes should be of sufficient size to cause only a small drop in pressure. The amount of this drop can be determined by comparing a steam gage at the engine with the boiler gage. Pipe bends and long-radius fittings are desirable, and the best pipe covering purchasable is a good investment. A steam leak $\frac{1}{32}$ in. in diameter working 24 hr. a day with 140-lb. pressure will waste something like 25 tons of steam per year. If steam is worth 25c. per 1,000 lb. this means $12.50, and if money is worth 8 per cent., the prevention of this loss would justify the expenditure of $150.

In the case of large hoists a steam receiver close to the throttle is often a great help. Steam separators with

reliable traps should invariably be placed in steam lines to deliver dry steam to the engines. These should be placed at each engine if these machines are scattered.

Economy and efficiency in steam-engine performance is principally a matter of design, and the purchaser should therefore look carefully into the relative costs of any steam engine he may contemplate buying. The relative costs are not the quoted prices but the expense of operating for a year, including the cost of steam for the actual running time, oil, supplies and labor, and adding depreciation and interest on the installed cost. Steam consumption guarantees should be requested when getting figures on steam-driven apparatus.

Considering, however, the equipment already in place, is it known whether or not engines are developing their maximum economy or if the valves are correctly set? The only proper way to determine this is to indicate the engines occasionally and correct the faults shown. Is it known what each piece of machinery is costing for packing, oil, repairs, etc.? I would suggest opening a card-index account with each machine to record these items. Sometimes a change in oils, perhaps the employment of a more expensive brand, will save money by reducing the friction loss. Oil wastes may often be caught, filtered and used repeatedly.

Space forbids further discussion of this interesting subject. By way of conclusion I would say that in the main the same broad principles of efficiency which govern the successful operation of manufacturing establishments apply with equal force to the business of coal mining.

Getting Clean Coal*

By Thomas G. Fear†

SYNOPSIS—Many elements, some readily susceptible of control, others resulting from natural causes, govern the production of clean coal at the mines. The manipulation of the human element, the method of mining followed and the system of dockage employed are factors governable by the operator that have a decided bearing on the production of a clean mine product.

With the motto of "Safety first, quality second and production third," the coal-mine officials' second-best efforts must necessarily be exerted in getting clean coal. In studying the inside practices the following factors must be considered: (1) Natural conditions of the seam; (2) human element, labor; (3) method of mining; (4) system of dockage.

Coal seams with hard roof and bottom and only hard partings naturally produce less impurities than those with fireclay bottoms and shale roofs, for the reason that in the latter the impurities break up and mix with the fine coal. Fireclay bottoms are especially troublesome in machine mines, as the machines tear up the soft bottom and mix the small particles of fireclay with the machine cuttings. If the miner loads this mixture, he is sure to be docked; and he is not allowed to throw it in the gob as it contains too much coal. The usual procedure is to allow the miner to load the mixture and waive the rules.

Hard, flat seams underlaid with a 5- or 6-in. stratum of fireclay can be best mined by undercutting in the clay, blasting or wedging the coal down and loading practically all the coal with the hands.

Some seams have partings of fireclay, or soft slate, which may be cut out by the use of post mining machines if the pitch of the seam permits. The machine cuttings in this case must be loaded out and sent to the rock dump as they may at times contain too much fine coal to be thrown back in the gob.

Thick seams with thick, hard partings may be worked by removing the lower bench of coal first and then shooting down the top coal and rock together.

The human element is the greatest factor in the production of clean coal, and conditions which affect the labor have a corresponding effect on the quality of the output produced.

The mine with a majority of married miners, well housed and contented in every way, will load the cleanest coal. The distinction is made between married and single men for the reason that the married man, owing to his greater responsibilities, is more amenable to the company rules. His dismissal usually adds the expense of moving to his other troubles, while the single miner simply picks up his suit case and migrates to the next mining camp.

At most mines the loading of more than a certain amount of slate means the dismissal of the miner, and this fact is taken advantage of by some men who either want to be dismissed in order to get their money or wish to cause the dismissal of some other miner against whom they have a grudge. At a certain mine the weighman found a car with the bottom half all rock. The miner whose check number was on the car was dismissed, but upon investigation it was found that the slate in the car did not correspond with the slate in his place, but was similar to that in another miner's room. These two men had had a quarrel and the second miner put one of the other miner's checks on a dirty car, hoping to have it picked.

There are also some miners who, not having the best interest of the company at heart, purposely load a small amount of slate in the bottom of their bug-dust cars, thinking that the slate picker will not readily detect it, as the bug-dust cars usually contain clean coal.

The four methods of mining, so far as the production of clean coal is concerned, can be ranked as follows: (1) Hand mining; (2) hand undercutting; (3) machine undercutting; (4) shooting on the solid.

The miner who digs his coal has the best opportunity of getting a clean product, for the reason that the coal is dug off in small quantities and any impurities can be readily detected. As no explosives are used the impurities are not shattered and mixed with the coal.

The American seam is a good example; this measure contains a slate parting 2 in. thick about 5 or 6 in. from the top and a second parting, or "middleman," from 6 to 17 in. in thickness about 18 in. from the bottom. At a number of places there is a soft rash from 1 to 2 in

*Paper read at the annual outing of the Alabama Coal Operators' Association.

†Superintendent, Bayview mine, Tennessee Coal, Iron and Railroad Co., Ensley, Ala.

thick on top of the "middleman," and the miner digs off the coal above the rash and then carefully removes the rash, which is thrown in the gob. After the top bench is worked off to a depth of 5 ft., holes are drilled in the bottom coal immediately below the "middleman," which is then shot up and removed. No other system of mining would produce as clean coal, and although the tonnage per miner could be increased by machine mining, the gain would be offset by the cost of washing. Undermining this coal and shooting the whole seam would mix up the small impurities to such an extent that the miner could not clean the coal, and the entire product would have to be sent to the washer before being coked.

Hand undercutting should produce coal slightly less clean than that hand mined for the reason that the undercut is usually from 3 to 3½ ft. deep, the amount of explosive used is not large, and only a few tons are shot down at a time.

Machine mining ranks third in the production of clean coal. The machines in the Warrior coal field undercut the coal from 4 to 7 ft., the height of the cut is about 5½ in. and the holes are charged with from 1½ to 2 sticks of permissible powder. More than 2 sticks of powder per hole will break up the coal and partings and make the cleaning more difficult besides increasing the danger element. As a rule the shots are fired by fuse and caps and the charges exploded at intervals of from 1 to 3 min., causing the coal and slate to mix more than if all the shots were fired simultaneously by an electric battery.

Shooting on the solid usually produces the dirtiest coal because as a rule large charges of powder are employed and shots are so placed that one is dependent on the other. The large charges shatter the slate into fine pieces and the dependent or following shots scatter the coal and shattered slate about the face of the room, thus making it difficult for the miner to clean the coal.

The distribution of empty cars to the miner and the point of delivery are important factors in the production of clean coal. Where the empty cars can be delivered to the miner at the working face, he has ample time to clean his coal. Where it is necessary for him to rush out to the entry when the trip riders call out, "Here are your empties," and push the cars to the face, load them, and have them back to the room neck by the time the locomotive returns, little time is given to cleaning the coal. The mine foreman may have been preaching just the day before to this miner about clean coal and how to pick out the slate while waiting on empty cars, but the spirit of procrastination is too strong, and when the empty cars arrive he is too busy to pick slate.

With certain given natural conditions and the most economical mining method adaptable to these given conditions, the next consideration is the selection of some effective method of discipline or punishment of those miners who load excessive amounts of slate. As practically all the coal is loaded on the tonnage basis, the miners desire to load the maximum amount each day.

There are several dockage rules enforced by the various companies in Alabama, but the one in most general use is to dock the miners according to the amount of slate picked from their cars. These cars are picked by slate pickers who are either paid by the day or a stipulated sum for each can, keg, or pound of slate picked.

The miner is docked a certain number of tons of coal for a certain amount of slate, there usually being a limit above which he is either suspended or dismissed. With this system the slate picker should be required to show the weighman each can of slate picked, place the slate removed from each car on a platform and show the check number of the miner loading the slate. This gives the miner an opportunity to see just what he has loaded.

Cases have frequently occurred where the slate picker was paid by some of the miners not to pick their cars, but this practice can easily be prevented by not allowing the slate picker to know the check number on the car.

A recent case was noted where a colored miner was much surprised to learn that the last car he loaded was picked and 12 cans of slate found in it; he had calculated that the day slate picker would not pick his car late in the afternoon and that the car would be hoisted and dumped before the night slate picker went on duty.

Some companies have a system of deducting a fixed number of pounds of coal from each car the miners load, others suspend the miners, while some use the dockage and suspension combined. A fair system of dockage for each offense and suspension for persistent loading of over a certain amount of slate is the most effective.

The system of deducting a fixed amount from each car the miners load discourages rather than encourages the loading of clean coal, for the conscientious miner knows that he is being docked for the careless miner's wrongdoings. On one occasion the state mine inspector found a miner breaking some slate and loading it in his car and rebuked him for so doing. The miner replied that the company was taking 200 lb. off every car he loaded and that he was going to be quite certain that the company got the 200 lb. of slate for which he was penalized.

At one mine the docking was done by picking a number of cars each day, averaging the slate, and docking all the miners that amount the day following. This is just as unfair a method as the deduction of from 80 to 500 lb. per car.

In seams where impurities are present it is almost impossible for the miner to load perfectly clean coal, and to have coal loaded reasonably clean requires only fair and square treatment by both company and miners.

The company should guarantee fair treatment to the dockage system, and should exact fair treatment from the miners by the strict enforcement of the dockage rules.

Look Forward

If all the sobs and sighs and tears
Of all the dead and vanished years
Were brought together in one spot,
Their energy combined could not
Restore one single shattered dream,
Rejuvenate a fruitless scheme,
Repair one broken pledge or heart,
Or render straight a crooked start.

So why waste time in vain regret
Today is here and must be met;
Start out anew, forget the past,
Great fortune still can be amassed;
Great reputations still attained,
And posts of honor yet be gained.
Look forward, yesterday is dead,
The Land of Promise lies ahead.

—Herbert Kaufman,
in "New York American."

Analysis of the Coal Car Situation

COMPLIED BY A. T. SHURICK

SYNOPSIS—Conforming with its usual custom at this time of the year, "Coal Age" presents herewith official comments from the leading coal roads as to the outlook for the coal-car supply during the coming fall and winter. The reports this year show a notable absence of the usual confident attitude assumed by most of the railroad officials, and it is clear that there is no little anxiety over the outlook. On the other hand, it is encouraging to note that substantial improvements and additions have been made as a result of the largely increased earnings.

CHESAPEAKE & OHIO RY.

By J. P. STEVENS, General Manager

During the past year this company's appropriations for the maintenance of equipment have been most liberal, a considerable number of old light-capacity cars and locomotives having been retired and modern equipment substituted. The proportion of bad order cars and locomotives is less than for a number of years. The following shows equipment that will be available this fall, compared with that of a year ago:

	1916	1915	Increase	
Number of coal cars.....	36,281	34,553	1,728	4.8%
Capacity of coal cars (tons)	2,290,117	1,864,825	425,292	22.8%
Number of freight and switching locomotives.	717	706	11	1.6%
Tractive power of freight and switching locomotives (pounds)	33,640,846	31,547,148	2,093,698	6.6%

With a greater proportion of modern equipment, the same number of units are capable of greater accomplishment.

During the past year, about $500,000 has been expended in the construction of additional passing and yard tracks and a considerable amount of similar work is now in progress, as well as the construction of about 19 mi. of second track. At Newport News there has been very considerable additions to the yards completed during the past year, and 29,250 ft. of new track is now being added to the classification yard. To meet the rapid growth in tidewater coal tonnage, the company is now preparing to improve and modernize one of the existing coal piers at Newport News to take care of the bunker business, using the new steel pier for cargo business entirely.

LOUISVILLE & NASHVILLE R.R.

By G. E. EVANS, Fourth Vice-President

This company is this year adding 800 fifty-ton coal cars to its equipment, 400 of which have already been placed in service, and the remainder we expect to have in service within the next sixty days (Nov. 23). Notwithstanding this fact, the shortage of coal-car equipment is more acute than it has ever before been in the history of the company, which is the result of the coal being shipped in large quantities to distant markets and to the cars being held by other railroad companies, more especially north of the Ohio River and in the Northwest in the vicinity of Chicago. It seems impossible to secure the return of the cars.

Additions are being made to our terminal facilities at Cincinnati by enlargement of the yard at Decoursey, Ky.

Under date of Sept. 22, press reports from Louisville, Ky., stated that as against a nominal shortage of 500 or 600 cars at this season, the Louisville & Nashville on that date reported a shortage of 1,500 freight cars for the entire system.

WESTERN MARYLAND RY.

By S. ENNES, General Manager

Since our last report we have received the 15 new Mallet engines, and 3,000 new 55-ton coal cars, which has equipped us so that we anticipate no trouble in taking care of the demands on our line for the coming winter.

In addition to that, we are building 15 mi. of second track, increasing the length of our side tracks, and the capacity of our yards, in an effort to keep pace with our growing business.

To date (Sept. 18) our mines have had 100 per cent. car supply for the last six months, and we have every hope of being able to take care of the demand this winter.

NORFOLK & WESTERN

The following excerpts are taken from the annual report of this company for the year ended June 30, 1916:

Road and Equipment—The total additions to cost of road and equipment during the year were $7,373,726.31.

The double-track work reported in the preceding annual report as in progress, has been completed, also 1.71 mi. of new double-track work between Walton, Va., and Pearisburg, Va.

Double-tracking is now in progress between Walton and Pearisburg, Va., in sections totaling 12.50 mi., and between Alnwick and Joe, W. Va., 2.22 mi., which will be completed about May, 1917. There will then be in operation between Lamberts Point and Columbus 704.02 mi. of double track main line (including as second track the low-grade lines around Petersburg, Va., and Lynchburg, Va., the Burkeville to Pamplin Low Grade Connecting Line and the Big Sandy Line) and 3.31 mi. of single track. The single track is at Pepper Tunnel on Radford Division, 0.90 mi.; at Elkhorn Tunnel on Pocahontas Division, 0.70 mi., and at Columbus, 1.71 mi. The latter and the parallel track of the Cleveland, Akron & Columbus Ry. are operated jointly by the two companies as double track.

The new freight equipment received during the year was as follows:

30 freight locomotives (steam)
4 freight locomotives (electric)
371 all-steel flat bottom gondola cars, 180,000 lb. capacity
300 all-steel drop-bottom gondola cars, 115,000 lb. capacity
42 steel underframe cabin cars
50 all-steel air dump cars

The retirement of many old and light locomotives and the substitution of more powerful types during the last five years resulted in a decrease during that period of 28 locomotives (from 991 to 963), or 2.82 per cent. The aggregate tractive power, however, increased 24.13 per cent. The number of freight cars increased from 41,597 to 47,510, or 14.21 per cent., and their aggregate capacity increased 28.10 per cent.

Additions and Betterments to Way and Structures—65.88 mi. of main track were relaid with 100-lb. rails; 31.29 mi. of resawed 85-lb. rails were laid; 6.43 mi. on Durham District, 8.36 mi. on Scioto Division, 8.99 mi. on City Point Branch, 5.03 mi. on Widemouth Branch and

2.48 mi. on Toms Creek Branch; 763,877 cu.yd. of stone and 42,163 cu.yd. of gravel were used in standard ballasting of main line. Engine-erecting shop at Roanoke, Va., was enlarged and engine house at Winston-Salem, N. C., extended. The power house at Crewe, Va., was enlarged and boiler houses were erected at Auville, Vivian and Kenova, W. Va. Signal towers were erected at City Point Junction, Jack, Burkeville and Pamplin, Va.

Industries—Among the new local industries are 15 coal mines. At the close of the year there were 149 companies organized for producing coal and coke on the company's lines, with a total of 246 separate mines, of which 236 were in actual operation. Of the 13,931 coke ovens, 5,603 were in blast.

Tug River & Kentucky R.R.—Track has been laid and is now in operation up Blackberry Creek, a distance of 1.37 mi. A run-around track, 0.34 mi., has been completed.

Williamson & Pond Creek R.R.—Leckie Spur, 1.03 mi., and "Y" connection with the main line, 0.15 mi., have been completed.

Jacobs Fork Branch and Cucumber Branch—Jacobs Fork Branch, 4.01 mi., has been completed. Tracks have been laid to operations of the New River & Pocahontas Consolidated Coal Co. and shipments are now being made. The Cucumber branch of Jacobs Fork Branch, 1.28 mi. in length, has been completed.

New York Central Lines*

By F. B. SHELDON, Vice-President

In common with all other coal carrying lines, we are experiencing a shortage of equipment. This is a most unusual situation at this time, arising from causes entirely beyond our control.

First, the abnormal use which is being made of coal cars for the transportation of commodities other than coal, which diverts the cars from the regular channels of the coal trade and scatters them from the Atlantic to the Pacific, keeping them away from home for many months.

Second, the misuse of our coal cars by other lines, which have not provided an adequate supply of cars for their own business, and who retain and utilize our cars to make up their shortage. Unless there is some improvement in these conditions the present shortage will continue throughout the fall.

Our motive power is in good condition, ready to handle promptly all traffic that may be offered.

New York Central R.R.

By A. T. HARDIN, Vice-President

This company has purchased 4,000 open cars during the year, and its allied lines have purchased a considerable number.

At the present time (Sept. 12) we have a surplus of motive power of all classes, but in anticipation of a continuation of heavy business during the winter the company has purchased 170 of the most modern heavy freight locomotives, to be prepared for the contingencies of bad weather and an additional volume of business during the winter months.

The company has heretofore practically completed its work of grade revisions and has found its terminals substantially adequate for the unprecedented industrial condition.

*Including the Toledo & Ohio Central Railway Co., the Zanesville & Western Railway Co. and the Kanawha & Michigan Railway Co.

HOW "THE RETAIL COALMAN" INTERPRETS THE SITUATION

We are seeking to make our equipment effective by rapid movements, and are soliciting the coöperation of shippers and consignees to avoid detention of cars at destination. This latter is most vital for the common good of all.

It is probable there will be some temporary shortages, but it is not thought that these will be of sufficient magnitude to retard our industrial activities.

Hocking Valley Ry.

By M. J. CAPLES, Vice-President

The condition on the Hocking Valley this year is quite different from what it was last year. We are having the largest gross earnings in our history, and as a consequence we have no idle cars. Last year we had 3,500 idle coal cars stored on the line.

The coal business along our line is gradually reviving, but it does not yet equal the maximum production of past years. This is true of the State of Ohio in general, where the coal production suffered a serious reduction during the years of 1914 and 1915. We have a great many more coal cars than we need to supply the mines on our own line. The surplus coal cars are sent to West Virginia lines for loading, and we participate in the haul. As the needs of our mines increase we will withdraw our cars from the West Virginia service so there will be no danger of a shortage of coal cars on the Hocking Valley Ry.

Buffalo, Rochester & Pittsburgh Ry.

By E. A. NIEL, Coal Freight Agent

The Buffalo, Rochester & Pittsburgh has endeavored in the past to keep its coal-car equipment fully up to the demands of the mines on its line, frequently

anticipating the requirements of its shippers, and has been able to supply practically 100 per cent. of the cars needed.

At the present time, out of a total freight-car equipment of 17,904 cars, there are available for coal and coke traffic 14,750, or an average of 25 cars per mile of road. Under normal conditions, contemplating reasonable movement of loads to destination and prompt return of empty cars, this should be sufficient to insure ample car supply for a traffic amounting to 12,000,000 tons per annum or about 20 per cent. greater than is now (Sept. 26) being moved. The number of coal and gondola cars owned by this company per mile of road probably exceeds that of a majority of coal-carrying roads, and this equipment is usually maintained in good order so as to provide a maximum of efficiency in transportation. No new equipment has been purchased during the past 18 months, but new steel underframes have been put under 5,061 cars, which have made them available for service, making the equivalent of new equipment to that extent. This expenditure was made during the business depression, which existed during last year when there was a surplus of cars and freight earnings were at a low ebb, and is an evidence of the broad policy of the management.

At the present time, its freight-car equipment is being taxed to the utmost capacity and we are likely to encounter serious difficulties in the near future in supplying the full demands of our shippers due principally to two causes: First, the extreme shortage of labor at nearly all points in the Eastern district causes slow unloading of cars at destination, and second, the congestion of freight on many lines resulting from the abnormal volume of tonnage now moving and the delay in releasing cars at destination, which in turn is reflected in the slow return of empty cars to the loading points.

The public, therefore, can render the greatest assistance in improving the car supply by coöperating with the railroads and unloading cars more promptly. While the railroads have invested millions of dollars in new equipment, as well as motive power and additional facilities for the prompt movement of traffic, it is a lamentable fact that the shippers themselves have done comparatively little in this direction.

The delay in unloading freight cars by consignees and the resulting congestion at terminals at first necessitated general embargoes against all traffic for certain railroads and has now developed into individual embargoes against traffic for certain consignees. This illustrates the efforts which are being made to avoid interruptions to traffic for those consignees who have provided themselves with the necessary facilities and who are not ordering a greater volume of traffic than they can promptly handle on arrival. The departments of all lines handling such embargoes have been compelled to increase their office force in order to handle the details involved in the transmission of such instructions.

In view of the conditions now prevailing and the prospect of an actual shortage in the supply of coal due to increased demands of commerce, we are likely to face a shortage of coal-car equipment during the fall and winter months greater than has heretofore been experienced. Its severity and duration will depend largely upon the ability of consignees to promptly unload freight cars and upon the prompt movement by the railroads of empty coal cars to the mines.

Central Railroad of New Jersey

By W. G. BESLER, President and General Manager

This company acquired 2,000 additional cars during the past summer, so that we are very well supplied and do not expect to have any difficulty in keeping our patrons supplied with equipment.

If the mines were as well equipped with miners as the railroads are with cars, it would be a much better situation. With holidays, feast days, weddings, or any other excuse, the question of individual output per miner is a most serious one. In another year we will have some data which will firmly establish the fallacy of the thought that reduced hours and increased wages produce a more "intense service" on the part of a workman.

Philadelphia & Reading Ry.

By C. H. EWING, General Manager

So far as the Philadelphia & Reading is concerned, there are no additions to motive power, coal car equipment, improvements in grade elimination, perfecting alignment, and enlarging terminal facilities, now under contemplation for the coming year.

So far as the car supply is concerned, we have always been able to provide a full supply of coal cars for shippers on our line, and while the indications are that there will be a large demand for equipment during the coming winter, I have no reason to doubt our ability to meet that demand.

Delaware, Lackawanna & Western R.R.

By E. E. LOOMIS, Vice-President

We hope and expect to fill all demands for cars to load with coal on our line during the coming year. In fact, it is our specialty to anticipate and key up every one to take care of these wants.

Miscellaneous Notes

Under date of Sept. 22 it was announced that the Chesapeake & Ohio was in the market for 1,000 hopper cars and that the Union Pacific wants 500 coal cars, the Western Pacific 1,250, New York Central 500 coal cars, Western Maryland 2,000 hoppers and the Wheeling & Lake Erie 500 hoppers.

On Sept. 23 Samuel E. Taylor, cashier of the National Bank of Brownsville, Penn., stated that coal operators on the Pennsylvania R.R. branches in the Monongahela Valley were handicapped by a car shortage of from 25 to 35 per cent. The Pittsburg & Lake Erie was able thus far to provide all cars necessary. Coke trade in that district is near capacity, and thus far few operators report shortage of cars. The same holds in the Connellsville coke district.

Owing to the car shortage in Illinois and the complaints made by grain dealers and elevator men, the Illinois Public Utilities Commission sent a telegram to the Interstate Commerce Commission, at Washington, insisting that grain cars of Illinois roads held by Eastern roads be returned for the relief of grain loaders.

No Net Income in 100,000 Businesses—Leaving out of consideration the banking, railroad and public-utilities corporations and referring only to those that have to do with trade and industry, we find that there are about 250,000 business corporations in the country. The astonishing thing is that over 100,000 of these report no net income whatever. In addition 90,000 make less than $5,000 a year, while only the 60,000 remaining, the more successful ones, make $5,000 a year and over. In tabulating the data for all the corporations in the United States doing a business of $100,000 a year or over, the Federal Trade Commission found that out of a total of 66,000, 30,000 charged off no depreciation whatever

The American Mining Congress

The Government is sending its greatest experts to the nineteenth annual convention of the American Mining Congress, which opens at Hotel La Salle, Chicago, Nov. 13. There is also the hope that both the Secretary of the Interior, Mr. Lane, and Secretary of Labor Wilson will be present and take part in the important discussions. Van H. Manning, director of the United States Bureau of Mines, will deliver an address on "The Past and the Future of Mine Safety Work." This will emphasize the tremendous advance already made through the efforts of the Mining Congress and the Bureau, in the way of safety methods, and outline the greater needs of the future.

W. S. Gifford, executive director of the United States Commission on Industrial Preparedness, will deliver what promises to be a notable address on "Efficiency in the Handling of Productive Forces." Chairman E. T. Hurley, of the Federal Trade Commission, will speak on "The Work of the Commission and the Mining Industry."

In all the "Sectional" meetings the experts will be present to advise. Dr. F. G. Cottrell's address on "The New Things in Science" will be one of the most comprehensive résumés ever given of the accomplishments of the past few years. C. E. Siebenthal, of the United States Geological Survey, is also one of the great Government experts who have promised to attend.

At the general meeting Tuesday, Nov. 14, the subject will be "Safety." Van H. Manning, director of the United States Bureau of Mines, will give an address on "The Past and the Future of Mine Safety Work." J. F. Welborn, president of the Colorado Fuel and Iron Co., has promised to be present and will take part in the discussion.

The Coal Section also opens in its own assembly rooms at Hotel La Salle on Tuesday, at 2 p.m., Charles M. Moderwell, of Chicago, presiding. S. A. Taylor will present a report of the committee on "Uniform Accounting Cost System," and Dr. F. C. Honnold, of Chicago, will lead the discussion. S. H. Robbins, president of the Pittsburgh Vein Coal Operatives; Hugh Shirkie, of Terre Haute, and T. L. Lewis, of West Virginia, are all to have something to say on this subject. Promptly at 3:30 p.m. the report of the committee on "Workmen's Compensation" will be presented by T. L. Lewis. This will be followed by an address on "The Distribution of Coal in Cities."

On Wednesday, with Dr. I. C. White, of Morgantown, W. Va., presiding, there will be an address on "The Colorado Industrial Commission," by Wayne Williams, of Denver. An effort is now being made to induce John D. Rockefeller, Jr., to be present and to address the convention on "The Rockefeller Plan" or on a kindred topic. S. D. Warriner, of Philadelphia, president of the Lehigh Coal and Navigation Co., is to give an address on "The Closed Shop and the Check-Off as Related to Efficiency in Mining Operations."

On Thursday in the Coal Section, with J. C. Kolsen, of Terre Haute, presiding, the principal address is to be on "Coöperation—the Great Necessity in Bettering Coal Mining Conditions and the Means of Its Accomplishment," by President Carl Scholz, of the Congress. A discussion of "Ways and Means" is to follow this address.

Recent Legal Decisions

Evidence in Personal Injuries Cases—A declaration made by a mine boss two hours after an accident occurred cannot be imputed to the coal company which employed him as an admission of negligence toward an injured man. A jury is competent to pass upon the question whether placing temporary rails along the track of a mine was negligence toward the driver of a mule, and hence there is no ground for admitting expert testimony as to what was proper practice under the circumstances. (Kansas City Court of Appeals, Cross vs. Northern Central Coal Co., 186 Southwestern Reporter, 528.)

Who Entitled to Refunded Freight Overcharges—When it appears that a railway company has exacted overcharges on a series of shipments between the same parties, the question as to whether the seller or the buyer is entitled to the refund is to be determined according to who was bound to bear the expense of transportation. Accordingly, where it appears that the seller contracted to deliver at the destination, he is entitled to the refund, although the buyer was credited on the purchase price with the amount of freight paid. (Minnesota Supreme Court, Jennison Bros. & Co. vs. Chicago & Northwestern Ry. Co., 158 Northwestern Reporter, 398.)

COMING MEETINGS

The American Mining Congress will hold its 19th annual session during the week beginning Nov. 13, 1916, at Chicago, Ill. Secretary, James F. Callbreath, Munsey Building, Washington, D. C.

The American Society of Mechanical Engineers will hold its next meeting Oct. 10, 1916, at 8:15 p.m., at the rooms of the society, 29 West 39th St., New York. Dr. Charles L. Reese, chemical director of the E. I. du Pont de Nemours Powder Co. will give an illustrated lecture on "Explosives." Secretary, Calvin W. Rice, New York.

A Miners' Field Day and First-Aid Contest will be held Oct. 21, 1916, at Jellico, Tenn., under the direction of the Tennessee Mine Foremen's Association, Southern Appalachian Coal Operators' Association, Tennessee Mine Inspectors and the Bureau of Mines. Twenty teams are expected to take part in the contest. Philip Francis, of Jellico, Tenn., is chairman of the General Committee.

The National Safety Council will hold its annual meeting and Congress at the Hotel Statler in Detroit, Mich., Oct. 17-20. The program is a long one, containing the names of 140 speakers. Wednesday and Thursday morning, Oct. 18 and 19, will be devoted to the mining section. At the Wednesday morning session after the reports of the chairman, secretary, committees and appointment of nominating committee, the following addresses will be made: "Accident Statistics," by Albert H. Fay, U. S. Bureau of Mines, Washington, D. C.; "Mine Safety Signs and Signals," by D. J. Parker and Edwin Steidle of the U. S. Bureau of Mines, Washington, D. C.; "Qualifications of a Mine Foreman," by J. W. Paul, consulting mining engineer of Pittsburgh, Penn.; "Workmen's Compensation and Its Effect on Safety in Mining," by H. M. Wilson of The Associated Companies, Pittsburgh, Penn.; "Mine Accidents and Their Prevention," by H. G. Davis of the Coal Mining Department of the D., L. & W. R.R., Kingston, Penn.; "Relation of Workmen's Compensation Laws to Accident Prevention Movement," by Dr. F. D. Patterson, chief of the Division of Hygiene and Engineering, Pennsylvania Dept. of Labor and Industry, Harrisburg, Penn.; "Underground Sanitation at the Mines," by W. A. Borchard, Austinville, Va.

On Thursday morning the first address will be on "Safety in Hoisting and Slope Haulage," by O. P. Hood, chief mechanical engineer of the U. S. Bureau of Mines, Pittsburgh, Penn., followed by "Mine Inspection," by William H. Jobe, Mine Inspector of Crystal Falls, Mich.; "Welfare Work," by E. E. Bach, mine safety director of the Ellsworth Collieries Co., Ellsworth, Penn.; "Mine Fires and Their Recovery," by Prof. J. C. Roberts, professor of safety and efficiency engineering, Colorado School of Mines, Golden, Colo.; "Mine Rescue Apparatus—Its Value as a Safety Measure," by Oscar Cartlenge, Ottawa, Ill.; "Metal Accidents and Their Prevention," by Prof. F. W. Sperr, School of Mines, Houghton, Mich.; "Education of Miners in Safety," by V. S. Stevenson, Cleveland Cliffs Iron Co., Ishpeming, Mich. Fifteen minutes will be allowed for the discussion of each of the addresses.

The safety exhibit will be held in the Armory every day from 3 p.m. to 11 p.m. Special exhibitions of first-aid teams will be given at 3 and 8 p.m.

The Labor Situation

General Labor Review

Miners at the Hazleton shaft, on Sept. 20, walked out on strike, but after a conference with Superintendent W. H. Davies, of the Lehigh Valley Coal Co., it was agreed that they would return to work the next day. It was stated that the men have objected to the shortening of their working time, they not having worked the full eight hours for some time. This condition, however, was not owing to any cause that the company could control, and when the matter was fully explained at the conference, the agreement to return to work was reached.

Notices were posted Sept. 22 at the Greenwood mine of the Delaware & Hudson Co., at Minooka, ordering all the employees out on strike. The dispute is over the signing of a wage scale presented by the local union connected with the colliery. Engineers, pumpmen, firemen and stablemen are included in the order to strike.

Another week of undisturbed activity at the anthracite operations in the Lower Lackawanna and Upper Luzerne County field furnishes further proof that the strike of the Industrial Workers of the World is entirely at an end and their organization shattered. There is nothing to even indicate the serious situation that beset this region the first half of September, when a reign of terror by the sympathizers with the I. W. W. strike cut down the working forces to from 50 to 25 per cent. of the normal number. The mines are still somewhat short-handed, owing to the large number of laborers who left the region during the trouble, but the operations are working full time.

Upon receiving permission from the mayor to hold a mass meeting for that purpose, 600 Italian employees of the Pennsylvania Coal Co. met in Pittston and agreed to return to work if the company would guarantee them their old working places. The company declined to treat with the men while they were still idle, and the employees returned to work without the assurance they sought.

The authorities of Lackawanna and Luzerne counties are preparing to push vigorously the prosecution in the cases of the I. W. W. agitators who were arrested in wholesale batches for inciting to riot, unlawful assembly and many other charges.

Four hundred employees of the Westmoreland colliery of the Lehigh Valley Coal Co., who were on strike for a week because they refused to work with 30 I. W. W. members who had returned after their strike, have resumed work, with the understanding that the Industrial Workers are to enter the union.

The labor situation in Somerset County is still improving. The local union at Holsopple has dwindled to less than 100 in number, with small attendance at meetings. J. Blair Kennerly has succeeded in starting his mine at Pretoria, near there, on a nonunion basis and is producing 50 tons a day and increasing the output. The Knickerbocker mines at Hooversville are holding their own and the Baker-Whiteley Coal Co. at the same place is gaining, while the Stauffer-Quemahoning Coal Co. at Listie is also holding its own, working nonunion.

At Myersdale and Berlin the locals have stopped paying benefits to the striking miners and many of them want to return to work nonunion. The Hocking Coal Co. at Garrett is cleaning up its mine, preparatory to starting work the first of the week, and the Consolidation Coal Co. is preparing to start up its No. III mine, near Myersdale, which has been idle for several months. J. O. Ream is not making any effort to start his mine near Berlin.

The United Mine Workers' District No. 2, comprising Cambria and Clearfield counties, which has been financing the efforts to organize Somerset County has depleted its treasury and is appealing to the national organization for assistance, which it is not expected will be rendered, and the local unions at Berlin and Myersdale are much disgruntled and dwindling in numbers.

Labor in the county is still scarce, but somewhat easier in spots, with a great deal of shifting around, some men going from farms to mines with the approach of winter. The car supply is getting worse.

In the Pittsburgh district labor and cars are both scarce, except that on the Pittsburgh & Lake Erie R.R. cars continue in fair supply.

Miners in the Daviess County field of Kentucky are returning to work on the old basis of pay. The men had organized as a branch of District 23, United Mine Workers, but the operators refusing to sign the union scale, it is understood that the miners have decided to resume on the former basis. During the strike, or lockout, most of the miners have been employed on farms owned by the mine operators.

Three thousand miners, employed by the Vandalia Coal Co. and the Vigo Mining Co. at the Dugger, Ind., mines have been called out by union officers of District No. 11 in an effort to enforce the mine workers' demand that the companies order for a change in lamps be rescinded. The controversy has been on since July 21, the companies having declared for electric safety lamps instead of oil lamps. Two agreements providing for 30-day tests of the new lamp have been rejected by the men. Eight mines are affected.

The miners' strike at Virden, Ill., continues. Both sides are firm and it looks as if there will be a prolonged struggle. The miners demand more than $6,000, which they claim they have been deprived of through short weight. The company has offered to pay a part of the amount claimed, but the miners are holding out for the entire sum. They also demand that the mine superintendent be removed. The company has asked the men to return to work pending arbitration, but the miners say there is nothing to arbitrate. Local unions throughout the Virden section have offered the strikers financial assistance.

The Anthracite Miners in Convention

Whatever aid the United Mine Workers of the Seventh Anthracite District of the United Mine Workers of America can give state or Federal investigators on the advance in the price of anthracite, following the ratification of the new agreement between the operators and their men last spring, will be tendered under the terms of a resolution adopted by the miners at their annual convention on Sept. 19.

The action of the producers in shifting the wage increase onto the consumer was denounced. The rank and file having received an increase averaging 15⅞ per cent. in wages under the new contract, the convention advanced the salaries of the district officers in proportion for the next two years. All the officers were reëlected, President Kennedy leading with a majority of more than 3,000.

All the recommendations of President Kennedy regarding the legislative program of the miners were adopted. The first-aid movement received the indorsement of the convention "provided it is managed on a democratic basis."

The miners are against the charging of dues for membership in first-aid clubs or practice outside of working hours unless with proper recognition of such service. A resolution was adopted favoring increased appropriations by the state and counties for mothers' pensions. It was decided to reintroduce at the next session of the Legislature a bill creating the office of assistant mine inspector. The adoption of an old-age pension system probably under Federal control, because anthracite is an interstate commodity, was referred to the national officers.

Limitations Upon Employer's Liability—In a suit against a coal-mining company for injury to an employee, due to a rail falling down a shaft while a cage was being loaded at the top, it is decided that an operator will not be charged with responsibility for injury to an employee attributable to defects in machinery or appliances, if the instrumentalities employed are in construction and operation similar to those commonly used by other coal operators under similar circumstances and the injury is such that it could not have been reasonably foreseen except as a result of negligence of a fellow-servant. Although an employee temporarily transferred to more hazardous work than his usual occupation is entitled to instruction against the peculiar dangers which he may not reasonably expect to appreciate, there is no liability on the employer's part for failure to warn against a danger which is just as apparent to employee as to the employer. (West Virginia Supreme Court of Appeals, Ferguson vs. Middle States Coal and Coke Co., 89 Southeastern Reporter, 151.)

Editorials

A Fictitious Market?

It is becoming clear that the big interests are exerting all their energies to put the brakes on what threatens to be a runaway market. But in spite of their best efforts the demand for coal continues unabated. The present activity is certain to go down as a unique experience in the coal trade, and if the next few months are to be judged by the current situation, the most exciting times are yet to come.

However, all are not agreed that conditions are as tense as they seem. Some shippers and retailers believe that present conditions are exaggerated and will soon right themselves. Nevertheless the indisputable fact remains that the mines are running short-handed, and if relief is in sight no one seems willing to say from where it will come.

In support of this latter contention it is interesting to refer to a most unusual circular letter sent out by the president of one of the big operating companies to his selling agents. He informs them that owing to the scarcity of coal, they are to look out for their best patrons only and that all orders from dealers whose accounts are in arrears are to be held up. The activities of the salesmen are also to be restricted, both to save traveling expenses, and to avoid booking business that cannot be taken care of properly.

As already intimated, there is some difference of opinion as to whether there is any actual scarcity of coal. Occasionally a dealer is met who freely declares all his orders are being filled promptly and that he has plenty of coal. Most of the better class of dealers are undoubtedly well supplied, and their desire for increased shipments seems to be mostly from the fear that there might be an actual shortage. They certainly have not been carrying capacity stocks by any means, but most of them have for several weeks been sending out more coal than they have been receiving. The general public seems to be slowly awakening, and numerous dealers now have sufficient orders from their customers to keep them busy until the first of November.

Coal and the Uniform Bill of Lading

The recent Federal Bill of Lading Act (Pomerene Bill) will force changes in the proposed uniform bill of lading and it is in recognition of these that the Interstate Commerce Commission has extended the time for filing briefs from Sept. 15 to Oct. 15. The date for final argument is fixed for Oct. 20. Then it is expected the Commission will conclude an investigation that has extended over several months.

While the new bill of lading will now have to include the negotiable and other features of the Pomerene Act, the required changes are not vital to the coal industry. What does concern the latter is the long-desired separate bill of lading for coal, and the subject will probably be brought forward prominently in the October hearing.

The coal dealers' associations of the Central States took a strong stand on the matter at the conference between representatives of the railroads and shippers held in Washington the week of Apr. 10, this year. They argued that a brief and yet comprehensive form could be devised to fit the conditions peculiar to the traffic and that it would be better for all concerned to use a separate bill. The railroads at that time, however, took the general position that the needs of coal traffic could be taken care of adequately in the bill uniform for all commodities. No agreement being reached, the coal representatives sought to have incorporated in the general merchandise bill such provisions as are most important to shippers and receivers alike, and readers of *Coal Age* will want to follow the further progress of the matters in dispute.

The coal people have already succeeded in getting the support of the large shipping interests of the country for several of the provisions which, if finally incorporated in the uniform bill of lading, will be of distinct benefit. One of these involves the liability of the carrier for shipments *in open cars*. The railroads contend they shall be liable only for negligence, while the shippers insist upon holding the carrier to full responsibility for the protection of coal in transit. Shippers take care to urge also that it be the duty of the railroads to give prompt notice of shipments that are rejected or unclaimed at destination or those that are lost or destroyed in transit.

Likewise it is of daily importance that the consignee be notified when coal is transferred from one car to another en route and that prompt notice follow when the carrier confiscates coal in transit. In case of transfer the notice should contain the new car designation. As it is now, the new car usually goes on to destination with no record on file with either consignor or consignee, and often when coal is confiscated it takes months of correspondence to discover what becomes of it. A very important feature of the proposed conditions is the following:

> The consignor shall be liable for the freight and all other lawful charges, except that if the consignor stipulates, by signature, in the space provided for that purpose on the face of this bill of lading, that the carrier shall not make delivery without requiring payment of such charges . . . the consignor shall not be liable. . . . Nothing herein shall limit the right of the carrier to require at time of shipment the prepayment or guarantee of the charges.

To this the carriers agree, and certainly if the provision is carried out in good faith it will safeguard the shipper in cases where coal is sold f.o.b. mines and consigned to irresponsible parties. The coal shippers would like the clause broader still; they would like to insert after the words "on the face of this bill of lading" the further provision *"or in a written order of consignment."* This would afford the jobber who sells and reconsigns coal in transit the same benefit that is now proposed for the original consignor. That is another point that will be argued before the Commission.

It is gratifying to find that the grain interests are in sympathy with the coal trade in urging a better rule to adjust losses in transit. The railroads contend for the old provision that the invoice at the time and place of shipment shall govern settlement of claim. Coal factors, on the other hand, know there are often long periods when coal changes ownership several times en route and each sale is at an enhanced price, and they insist that market value at the time and place of delivery would be a fairer basis. From the moment it leaves the mine, coal on an f.o.b. basis belongs to the consignee and if lost in transit it is the duty of the consignee to file the claim and to look to the carrier for compensation. It is felt that such a provision would make for more prompt as well as more equitable settlements.

In all there are about seven points to be submitted to the Interstate Commerce Commission for final decision. Whether a separate bill of lading is granted or not, the provisions already agreed upon by the carriers mark a step in advance. The extension for filing claims from four to six months is among these. But if the points we have particularly mentioned can also be ordered inserted they will together form a noteworthy modification of the contract of carriage. The rights and duties of carriers and shippers are alike shown by the bill of lading, and it is of much importance that operators, jobbers, retailers and large consumers of coal make their position very clear while the matter is in hearing before the tribunal that has power to act.

Petromortis

"Petromortis" is the medical term that describes death resulting from the inhalation of the poisonous gases exhausted from a gasoline engine or motor. It is derived from three Latin words: *petra,* a rock; *oleum,* oil; and *mors,* death. Gasoline is a product of the distillation of crude petroleum or "rock oil."

Again, the subject of the use of gasoline motors in mines, for any purpose whatsoever, but especially for haulage purposes, has been brought to the fore and is being discussed in the columns of *Coal Age*. Arguments for and against their use are being freely advanced. The chief argument in favor of this type of motor is that the power is self-contained, and it is claimed that, since they do not require the expensive installation that is necessary for the operation of either electric or compressed-air motors, they are particularly adapted for smaller operations where an expensive power installation cannot be considered.

The chief argument against the use of gasoline motors in mines is the danger that they present, and which is imminent often when least expected, because of the very poisonous character of the exhaust gases of the machine. Particularly is this danger increased when the motor is operated in a portion of the workings where the air is comparatively stagnant, or in an inclosed place, such as a pumproom, or when such a motor is used for the operation of a booster fan. Also, when a locomotive is traveling with the air and about at the same speed as the air current, there is an unsuspected danger of the motorman himself being overcome, which might result in a serious accident from the motor being uncontrolled.

The incident given in connection with Letter No. 1, in the discussion of this subject, page 550 of this issue, is worthy of the most careful consideration by all mine operators, superintendents and mine inspectors. The incident here illustrates vividly the instantaneous effect and the terrible results that may arise, at an unforeseen moment, in the operation of a gasoline motor in a mine. A point to be remembered is that the exhaust from a gasoline motor becomes dangerous when the motor is operating imperfectly, and coal operators are prone to allow the motor to work throughout the day under such conditions if there is an urgent demand for coal.

Inspiration

The very word inspiration creates an atmosphere of hope, expectancy and determination. A thought that inspires the mind animates the muscles, quickens the circulation and nerves a man for action. To inspire is to breathe in, as when the breath of life enters the body. To inspire a man is to breathe into his mind a desire for action, thereby animating his thoughts and lifting him higher. All spires point upward.

The result of inspiration in men is their individual aspiration, which is a breathing out of the same impulses, showing one's ambition for higher things and greater attainments. Success is the goal of an aspirant, while enthusiasm accompanies and charms him on his way.

Inspiration is the work to which *Coal Age* is devoted. To inspire its readers to higher aims and greater activities is its chief aspiration. Encouragement comes to us through many letters bearing testimony to the work accomplished, and we hope for more and still stronger letters bearing the same evidence. Following is a sample of the many received:

I want to tell in my letter the good that "Coal Age" has done me. I like the paper better every week—far better than when I first started to read its pages. It has helped me in many ways, but the best of all is that, after studying and reading three months, I succeeded in passing the examination for a first-class mine foreman's certificate. I want to give "Coal Age" full credit for the help it has been and is yet to me in my daily work.

Kindly allow me to suggest that we improve "Coal Age" by getting all classes of mine workers, including those that work in different departments in and around the mines, to tell their experiences. This will help to reduce mine accidents and increase every man's efficiency by showing how different kinds of work can be done most safely and readily. Drivers, motormen, trackmen, timbermen, rockmen and engineers can all assist in making "Coal Age" what it ought to be—a source of help and of pleasure. C. L. G.

Adger, Ala.

Such letters as the above are always greatly appreciated by *Coal Age*. We gladly second the suggestion made in this letter, that our readers, in every class of mining work, send us brief stories of their daily experiences and suggestions. We are inclined to start what may be properly called an "Inspiration Department" in the paper, where helpful suggestions and testimony of the good the paper has done its readers will appear, from time to time, as received. Such communications should, however, be brief and to the point.

Last week, "Coal Age" announced the winners of the contest, that was originated with the idea of benefiting first the coal industry at large, and second the paper itself. We stated in our last issue that further announcements pertaining to the contest would be made this week. We are compelled however, to postpone such discussion until after the issuance of the special "Safety First" number, which is to appear on Oct. 7. The articles in the Oct. 7 number of "Coal Age" will be the best discussions on safety ever presented to mining men and should be carefully read.

Department of Human Interest

Humane Treatment of Mules

The Colorado Fuel and Iron Co. has issued a bulletin on the treatment of mine mules known as "Special No. 9, Vol. 1, C. F. & I. Industrial Bulletin." This little 4-page pamphlet in part appeals to the employee to treat mules kindly and in another part gives a human interest story entitled "Chapters from Life of a Mine Mule." It also describes the work of the company in taking care of the mule, from which description the following facts are taken.

The company has a regulation under which men may be discharged without notice for "inhuman abuse of live stock or negligence resulting in the death of the animals." An expert veterinarian is employed and a mule hospital is maintained at a central point in Las Animas County where injured or seriously sick animals are taken for medical or surgical treatment.

The following excellent rule is in force: At each mine 10 per cent. more mules than are normally needed are kept on hand for emergency work and to relieve injured or

OPERATING ON MULE FOR RELIEF OF SPAVIN LAMENESS AT C. F. AND I. MULE HOSPITAL

tired mules. Mules working underground, except in emergencies, are in harness only 8 hr., and sometimes a much shorter period where the work is unusually heavy.

At all mines in the Trinidad and Walsenburg districts the stables are above ground. In other districts there are a few underground stables, which are kept in just as sanitary and comfortable a condition as those on the surface. All the stables have large stalls floored with packed earth and coke braize or planking. Ample provision is made for light, and air drafts are prevented in order that mules may not take cold after coming from their work. Drainage is supplied by arched alleys.

Water is furnished all mules in abundance in the mines, as well as at the stables. Sometimes this water has to be piped from long distances at considerable expense, but no mule ever lacks for a drink of water in the stable or at work. The stables are cleaned daily, and sometimes twice a day. In the underground stables the manure is hoisted from the mine each day, and drainage is provided by pipe or sewage line to the sump, where it is pumped to the surface.

The company owns about a thousand mules, the average value of each animal being $157. These mules are used principally in the coal mines, although a large number are in the iron mines and limestone quarries, and some in the Minnequa steel works.

First-Aid Miner in Role of Public Benefactor

The value of first-aid work at the collieries has never been better shown than in the recent saving from drowning of Charles Ball, of Tamaqua, Penn., at Lakewood Park. Peter Machunis, a member of the first-aid corps at the Shenandoah City colliery, was the man who saved Ball's life.

In a report to the Philadelphia & Reading Coal and Iron Co. by Joseph B. Garner, division superintendent, Mr. Garner says that the accident happened on Aug. 6, Ball being overcome while bathing. He was under water for 7 min. Efforts by bystanders to use a lungmotor were futile. Machunis, however, who had received first-aid training, went to work on the man.

"He took charge of the case," the report says, "and by the use of artificial respiration for a period of one hour and a half he restored Ball to consciousness. Ball was then carried to the pavilion where his body was rubbed to further develop his recovery. Machunis thus saved the life of Ball, and the Lakewood Amusement Co. showed their appreciation of his services by acknowledging them in a letter and inclosing a free ticket good for three years entitling Machunis to the free use of everything on the grounds."

This is the second noteworthy case where men who have received first-aid training have, by efficient action in an emergency apart from regular duties at collieries, succeeded in saving life says the *Pottsville Journal*.

The first instance occurred two years after the work of training mine workers in first aid was started. A miner belonging to the first-aid corps at the Enterprise colliery near Shamokin, Penn., saw a crowd and found that a miner had been overcome by gas. The man's body was under a tarpaulin, and the miners had sent for the undertaker. Asked if they were sure that life was extinct, the miners said they were, as the man did not breathe. The trained miner then went to work and by artificial respiration brought the man to life, and in an hour the patient walked home, while the undertaker who had been summoned looked on.

Operators in West Virginia Are Generously Assisting in the relief of the flood victims on Cabin Creek, Coal River and wherever else assistance is needed. The Winding Gulf and New River Operators' Associations have each voted $1,000 to the relief of distress. The coal operators of the Fairmont district are also contributing liberally to relief funds.

Discussion by Readers

Springs on Mine Locomotives

Letter No. 2—Referring to the inquiry of "Motorman," *Coal Age*, Sept. 9, p. 441, permit me to say that the greater tractive power of the lighter, single-type Goodman machine is not because it has no springs. In my opinion the difference between this machine and the two double-type machines mentioned as being mounted on springs, is the result of their different construction in other respects.

Both the General Electric double-type and the Goodman double-type locomotives are equipped with two armatures, each armature being connected with and driving one pair of wheels and working independently of each other. On the other hand, the single-type Goodman machine mentioned has but one armature, which is placed between the pairs of wheels and at right angles to the axles. This armature is connected by bevel gears with each axle so that neither pair of wheels can slip without the other doing the same.

It is easy to see that where all four wheels work together, as in the single-type machine, the tractive power due to the weight of a locomotive and the adhesion of its wheels to the rails is greater than in the double-type machine where each pair of wheels works independently of the other.

In this connection I want to draw attention to another feature that to a certain extent affects the tractive power of a locomotive. When hauling a heavy load, the pull on the drawbar of the locomotive has a tendency to throw a greater weight on the rear wheels of the machine and thereby reduce the weight resting on the front wheels. The springs on a locomotive tend to equalize the weight resting on both pairs of wheels and thus to utilize the full tractive power of the machine.

A locomotive without springs does not possess the same advantage in this regard, owing to the drawbar pull reducing the pressure on the front wheels. I mention this as being a point of interest in locomotive haulage. The same tendency exists in both the double-type and the single-type machines, but in the double-type machine the effect is to cause the front wheels to slip quicker than they would otherwise. I think this question is one of great interest in mine haulage. GEORGE COLE.

Yatesboro, Penn.

Gasoline Motors in Mines

Letter No. 1—Most gladly do I second the opinion of "Mine Foreman," *Coal Age*, Aug. 12, p. 277, regarding gasoline motors in mines. My experience in two mines, and the taking of a sample of air from another mine, is not favorable to this class of motors for mining work.

In one instance a gasoline locomotive was put in operation in a mine at Sorento, Ill., on a 30-day trial, guaranteed to haul at least 500 tons a day from the inside parting to the shaft bottom. For the greater part of this haul, the grade favored the movement of the loaded cars. I believe the best performance of that locomotive was 350 tons a day, and the result was that the motor was taken out of the mine.

In another mine, two locomotives hauled from 1,000 to 1,100 tons a day, with the grade in favor of the load the entire distance. I do not recall making a single visit to that mine, as inspector, when complaints were not made by the men at the shaft bottom in regard to the exhaust from those motors. They claimed that the exhaust gases gave them the headache and some of the men quit on this account. They said that the conditions were a lot better while I was in the mine than at other times. I was forced to conclude that the motormen were more careful on my visits to the mine to regulate the feed of gasoline, and neglect to do this continually vitiated the air.

Carbon Monoxide Is Produced When Engine Is Working Badly

I remember that on two occasions before going into this mine, I detected that the exhaust of the machines was working badly, by the strong odor in the upcast current. The excuse each time was that they were compelled to use a poorer quality of gasoline, owing to the failure of their regular supply to reach them because of a wreck on the railroad. I found on examination that, owing to imperfect carburetion, only three of the cylinders were working, which explains the unusual pollution of the air.

It must be remembered that, under such imperfect working of a gasoline motor, the exhaust from the machine contains a certain amount of carbon monoxide (CO), which is the most deadly of the mine gases. The quantity of this gas given off by a locomotive under normal conditions can be estimated approximately, and it is possible then to determine the volume of air that must be in circulation in order to dilute this quantity of gas and render it harmless.

One point that is generally overlooked is the fact that when a motor is working for a short time in stagnant air, or when it is traveling in the same direction and at about the same speed as the air current, there is bound to result an accumulation of the exhaust gases that is harmful. The greatest trouble arises when a machine starts to work badly and there is urgent demand for coal. Operators will then keep a motor running, as long as the men can withstand the discomfort. A small percentage of carbon monoxide in the air will cause headache, and the poisoning from this gas has a cumulative effect on men continually exposed to such an atmosphere. A visitor stays but a short time in the mine and is not equally affected by the gas.

In my experience I have known of two mines where they had to take the motors out of the mine because the workings generated so much blackdamp that there was an insufficient amount of oxygen in the mine air to give complete combustion of the gasoline fed to the machines.

It has been argued that there is less danger from the exhaust of the gasoline motor than there is from a person coming in contact with exposed electric wires. While this may be true, the remedy is to be found in protecting

such exposed live wires, rather than in adopting the gasoline locomotives in place of electric haulage. I have yet to find a company that has a high regard for welfare work and the prevention of mine accidents that regards with any favor the use of gasoline motors in its mines.

The one argument that interests operators who do not care to invest the money required for an electric installation, is the claim that the power of a gasoline locomotive is self-contained. They fail to realize the troubles that follow in the wake of such a motor when installed in the mine. In mine haulage it is natural to crowd a locomotive to its limit, with the result that a gasoline motor is then apt to generate a larger percentage of the poisonous gas in its exhaust. Of three coal operators, with whom I have talked recently and who are using this type of locomotive in their mines at present, two regret ever having made the installation. At another time I want to say a few words about different types of locomotives and other forms of mechanical haulage in mines.

East St. Louis, Ill. W. L. MORGAN.

Letter No. 2—The discussion of the question of mine haulage and especially the gasoline tractor has been of great interest to me. The writer on "Mine Haulage," Letter No. 3, *Coal Age*, Sept. 16, p. 474, has described some conditions that approximate closely a problem that is confronting a small mine in this district. But there is one point that he has not mentioned that seems to me to be equally as important as the cost and general suitability of gasoline motors in mines, and that is the question of ventilation. I hope there will be some information forthcoming in this regard.

The colliery I have mentioned operates through a level 1,400 ft. long and produces only 100 tons a day. The grade of the haulage road is 1 per cent. in favor of the loads, but the roads are heavy and muddy, owing to a rock floor that weathers into a sticky clay. There is no power plant at this mine and power cannot be bought anywhere, since the mine is in an out-of-the-way district.

For the time being we are hauling partly by hand and partly by mule which, of course, makes the cost excessive. To reduce the cost and yet avoid the erection of a power plant, we had thought of installing a gasoline haulage engine. There is no doubt but that it will do our work more cheaply and last a number of years while the mine is developing, but having had no experience in the use of such motors we are uncertain as to the ventilation. Owing to specially favorable conditions in our mine we are able to depend entirely on natural ventilation, which is very efficient. We have no gas and, even in the extended workings, we have never been troubled with bad air. But a motor continually running in and out on one road may change these conditions.

The exhaust from gasoline autos stored in private garages, when the motors have been kept running while the doors and windows were closed, has been responsible for many deaths by suffocation, or poisoning, during the past year. While the conditions existing in any garage should be better than would often prevail in a mine, in many garages the windows, if there are any, are often closed, and only the wide door is open. Inside there are frequently a dozen or more cars, some with their motors running, off and on; and yet the men manage to keep working without serious inconvenience from eight to ten hours a day. Such a place will only be properly ventilated when a gale of wind happens to be blowing strongly into the doorway, and that might happen but once or twice a year. It seems as if these conditions could at times be worse than those that exist in a mine entry where there is a slow but steady current of air passing.

I hope someone with experience will throw light on this point and state what volume of air is required to dilute these gases and make them harmless. For example, with a slow and moderate current of air passing on the haulage road, would it be possible to operate a gasoline locomotive daily without inconvenience to the motorman and others in the mine? At present, the night air current clears the road for the next day. INQUIRER.

Sydney, N. S.

[In connection with the discussion of the harmful effects experienced in the use of gasoline motors in mines where the circulation of air is insufficient to dilute and render harmless the exhaust gases of the motor, the following pathetic incident that appeared a short time ago in one of the New York papers will be of interest. The report reads as follows:

Bellefonte, Penn., Jan. 22—William H. Noll and his bride of five days were asphyxiated by gasoline fumes in his garage last night.

Mr. Noll, who conducted an automobile repair shop and an auto livery, married Miss Miranda Mowery last Monday evening. He spent yesterday afternoon repairing an automobile, while his bride sat in the car and watched him. They were last seen alive about 7:30 o'clock last evening by Calvin Noll, his brother. At that time Mr. Noll was working on the muffler and stated that as soon as he got it in shape he was going home.

At 7 o'clock this morning a man took his car to the garage and noticed Mrs. Noll sitting in the car and Mr. Noll standing at the side, but left without saying anything. At 8 o'clock Calvin Noll visited the garage and was the first to discover that both man and wife were dead and evidently had been overcome about the same time. Mr. Noll's position indicated he was reaching to either open or close the throttle.

Coroner John Sebring was notified and he and other physicians, after a thorough examination, said both had been dead eight or ten hours. An inquest was held this afternoon and the verdict was that Mr. and Mrs. Noll were overcome with deadly fumes from the exhaust of the car, while trying out the motor.

Both Mr. and Mrs. Noll were well known here and their tragic death has been the chief topic for discussion today, especially among automobile owners and garage men, who for the first time have been brought face to face with the danger of "petromortis."

This incident illustrates in a striking manner the fatal effects that may be realized in breathing the gases discharged from a gasoline motor, especially when the motor is operating imperfectly or in a poorly ventilated place. As is well known to mining men, the effect on the human system of a very small percentage of carbon monoxide gas present in the air breathed into the lungs is practically instantaneous, and death results so quickly that the victim is often left in a lifelike position. This has been observed in many instances of mine explosions, when miners in a distant portion of the mine have been overcome by the afterdamp of an explosion before they were aware of its presence.

There are instances on record where men have been found in their working places, transfixed in the very position where death overtook them. One man is described as in the act of taking a bite from the bread he held in his hand. Another is mentioned as in the act of raising his pick for cutting the coal. The incident described in the above clipping must have occurred in a

close and poorly ventilated garage and shows that neither of the victims was acquainted with the deadly effect of the exhaust gases.

As has been previously described in *Coal Age*, carbon monoxide is rapidly absorbed by the hæmoglobin or red coloring matter of the blood. The affinity of this gas is from 250 to 400 times as great as that of oxygen, and its absorption renders the blood corpuscles inert, and death quickly results. When present even in extremely small percentage in the air breathed, the poisonous effect of the gas is cumulative, as its removal from the system is slow and difficult to accomplish. We are glad that attention has again been drawn to this question of the use of such motors in coal mines.—Editor.]

Cause of Miner's Nystagmus

Letter No. 1—After reading the editorial entitled "That Clonic Spasm of the Eye," *Coal Age*, Vol. 9, p. 975, one is in doubt as to whether the writer is ridiculing the possibility of a coal miner contracting the disease known as "nystagmus," or treating the matter seriously.

Many years ago I had this subject brought prominently to my notice by the following incident: At that time I was in charge of a colliery where the upper seam was worked with open lights, while a seam lying 120 yd. below required the exclusive use of safety lamps. Water had accumulated at one point in the lower seam and, unbeknown to the officials, a door had been displaced and almost closed the air passage leading to a shaft that was used for hoisting water in large tanks to the surface. As a result, an unusual amount of gas found its way into the upper seam.

Although the fireboss had examined that mine and reported it as safe for work, one of the more observant miners noticed that his candle "spired" in an unusual way. He concluded that it was caused by the presence of gas and at once proceeded to warn the other miners, who extinguished their open lights and escaped from the mine without injury. An investigation of this circumstance showed that the fireboss who examined the mine was affected with nystagmus and was unable to detect a gas cap when less than 3 or 4 per cent. of gas was present.

This incident led me to a careful study of firedamp detection in mines. I performed a number of experiments with testing lamps of different design, which brought me into close contact with Dr. Frank Clowes, who made the necessary tests of the percentage of marsh gas in samples of the mine air. I soon found that an essential feature of a good testing lamp was its ability to detect small percentages of gas. This result was attained in the lamp then known as the "Ashworth-Clowes hydrogen lamp" and in the "Ashworth alcohol lamp," the latter having three burners. With these lamps I was able to detect the presence of as little as one-quarter of 1 per cent. of gas in the air. I also experimented with what I styled an "electric-platinum gas tester," which, however, proved of no practical use.

About that time, two scientists, Dr. Snell, of Sheffield, and Doctor Court, of Staveley, were investigating the cause of miner's nystagmus. These two men held different opinions in respect to the cause of the disease. Dr. Snell attributed it to the fact that the miner was compelled to lie upon his side while performing much of his work in mining the coal. On the other hand, Doctor Court claimed that the disease was owing to the poor light produced by the Davy lamp. Miners were then using the Davy, Clanny, Mueseler and Marsaut, all bonneted lamps, none of which gave more than ¾ cp. of light.

It soon developed that the combined features of the Mueseler and the Gray lamps promised the best results in affording the needed protection at the top of the lamp and in yielding a good light. I adopted the conical shaped glass, as this threw a better light on the roof, which is important when examining a mine. In the Gray lamp, all the air entering the lamp is brought into direct contact with the wick flame, which increases its illumination to 1.25 cp.

As a means of observing more clearly the flame cap produced in gas and to eliminate the glare that affected the eyes of the miner, a white or colored enamel streak about 1 in. in width was made up and down the length of the glass. Later, a dull black streak was found to be of great benefit to the eye when testing for gas. If desired, such a dull black streak can be made on the inside of a clear lamp glass, by smoking it with a wax taper before putting the lamp together.

I have often wondered why miner's nystagmus is not more prevalent in this country. The coal is not mined here as frequently as in the old country, it being either machine cut or blasted off the solid. On this account, the cause described by Doctor Snell is eliminated largely from application to American mines. Another reason for the lesser prevalence of the disease here is found in the fact that the mines of this country are largely open-light mines, and carbide and electric lamps are coming into common use. The light by which the miner performs his work has thus been much improved.

The suggestion in the editorial to which I have referred, that the disease is due to a germ, or results from the presence of a worm, certainly starts a new phase of the question and one that discounts the idea of eye strain, which has hitherto been the generally accepted theory.

JAMES ASHWORTH,
Vancouver, B. C., Canada. Mining Engineer.

Gathering Motor Haulage

Letter No. 3—Like other mine managers, I have been interested in reading the several letters on "Mine Haulage," and particularly "Gathering Motor Haulage," as each of these subjects presents important problems in economic mining.

I used to think that motor haulage, under almost any condition, was better than animal haulage, and more economical. However, as the years roll by and my experience under different conditions of mining increases, I am more and more inclined to think that a mixed haulage system will produce coal cheaper than an absolute mechanical haulage, although I willingly admit that this must be governed largely by the conditions prevailing in the mine.

No one, I believe, will question the statement that the supreme test of a mine-haulage system is the cost per ton-mile in transporting the coal from the face of the headings, or rooms, where it is mined to the shaft bottom, or tipple, as the case may be. In a careful comparison of costs, in different systems of haulage in use, I have found that the limiting of the animal haulage, or as we say, the "gathering haul" to 1,000 ft., from the extreme working face to the motor parting where the trips are made up to

be hauled out of the mine, provides a more flexible system at less outlay than is possible where an absolute mechanical haulage is maintained from the working face to the shaft bottom, or tipple.

Something more than a year ago an agent for a storage-battery locomotive read a paper at a West Virginia Mining Institute meeting, in which he made the statement that his company had succeeded in reducing the cost of haulage in mines 10c. per ton. Now, I wish to say that any mine where the haulage cost amounts to 10c. per ton must be badly managed—either that or the conditions prevailing in the mine are exceedingly poor, making the haulage question a difficult problem.

I have in mind, at this time, a small mine where the cars are limited to a capacity of 2,500 lb. run-of-mine coal, and the roads in the rooms are laid with wooden tracking. The gathering haul is performed by mules that haul the coal from the working face to the inside parting, from which the motor hauls the loaded trips out of the mine, returning with the empties, the distance being about 1 mi. each way. There is besides a large quantity of stone that must be handled. In this mine the cost of haulage from the working face to the shaft bottom, during the month of July, 1916, was 5.09c. per ton, the mine having worked 23 days in that month.

With others, I hope to see this question thoroughly ventilated. It would be of interest to know if anyone is producing coal under conditions similar to what I have just described at a lower cost for haulage than that given above. In my opinion it is futile to talk about the advantages (?) of any system of mechanical haulage, except on a basis of a lower cost per ton-mile, as I have stated previously. Let us hear from others.

Moundsville, W. Va. JOSEPH VIRGIN.

Certification of Mine Foremen

Letter No. 5—It is common experience among practical mining men that there are those holding certificates of competency granted by examining boards whose actual experience at the working face is altogether lacking. Their mining experience may be limited to the dumping of coal on the tipple or performing other outside work, without having done actual work underground.

Many of this class of miners have been so fortunate as to have received a sufficient amount of early school education to enable them, by a study of the technical terms used in mining and by a few months' practice in the working of mining problems, to obtain sufficient knowledge to pass a fair examination before an examining board. These men understand quite well much of the theory of coal mining, but know little or nothing of its practical application in the mine. Possessed of a certificate of competency, they eventually work into the position of fireboss and from that advance to mine foremanship.

There are, of course, exceptions to every rule, but in the vast majority of cases these outside men with more of public school behind them than mine experience soon find to their sorrow that there is a great difference between knowing what to do and being able to put that knowledge into execution. The operator who employs a foreman of this kind sooner or later realizes his mistake. The man whose fitness to take charge of a mine is measured by what he has learned by proxy from books and from observation will prove a failure when put to the actual test.

On the other hand, there is the man who can show the required length of service in the mine and whose knowledge of mining conditions and work has been gained by ofttimes bitter experiences and hard knocks, such as every efficient mine foreman must go through before he can make a thorough success in mine supervision. Perhaps this man has had a half turn with "Dad," instead of a full turn with the detested schoolma'am, whose efforts to teach him the three R's he has since grown to appreciate.

Despite his limited educational opportunities in boyhood, this man has, by burning the midnight oil while working each day in the mine, learned how to measure air correctly and to solve simple mining problems. He realizes the need and benefit of splitting air currents in the mine and increasing the sectional area of airways, and his practical experience has taught him the necessity of building air-tight stoppings on all entries. His book knowledge is sufficient to enable him to measure yardage and keep a proper account of work performed and material used in the mine.

Notwithstanding his practical knowledge and experience, however, this man falls down in the examination, because he cannot answer a few technical questions given by the board. Now, there is hardly a doubt that this real miner has the making of an efficient mine foreman; but, as a result of his failure to pass the examination and obtain a certificate of competency, he goes back to the pick instead of advancing to the position he sought to obtain. Particularly is this the case if several trials end in failure.

FOREMEN NEED BOTH THEORETICAL KNOWLEDGE AND PRACTICAL EXPERIENCE

I would not, however, be understood as setting aside the benefit to a mine foreman of possessing theoretical knowledge in addition to practical experience. I thoroughly believe that theory plays as important a part in successful mine foremanship as practice itself. The mine foreman of ideas is a man who is able to apply theory to practice. While many of his theories may fail in their practical application, they are yet the groundwork from which has sprung all mining advancement and which today makes for safety and economy of operation in mining. The safety lamp, coal cutter, anemometer, water gage and barometer all existed as theory at one time in someone's brain. The practical man with no knowledge of theory becomes a mere automaton, following in the steps of another. Theory and practice must ever go hand in hand in mine management.

But, coming back to the certification of mine foremen, let me say that inefficient foremen who have practical experience with no knowledge of theory, or theoretical knowledge without experience, are the class of men who are actually responsible for that antipathy of mine operators for certificated men that has led to the growing demand of operators to select their own foremen.

Speaking from my own experience in relation to the theory and practice of mining and addressing particularly young men who are studying to fit themselves for mine foremanship, I would say to them, Get all the theoretical knowledge you can—the more the better. I do not mean to imply that you will need nine-tenths of it in the actual work that you will be called upon to perform; but, like Latin in our high schools, it will broaden your viewpoint and give you far greater efficiency than is possible to attain in the possession of practical experience alone.

Permit me to express in closing my belief that many state examinations are devoted too largely to the giving of technical questions. A candidate for mine foremanship should be expected to have enough technical education to enable him to meet intelligently and solve successfully the many problems with which he must contend in the mines. For a state examining board to expect more than this is against the best interests of mining practice. For the most part, mining boards are composed of mining men who know quite well what technical problems the average mine foreman is called upon to solve. In some cases technical questions form so large a part of the examination as to crowd out many vital practical questions that should be asked to test the candidate's capability.

Houston, Penn. EXPERIENCE.

An Efficient Coal Miner

Letter No. 6—In my opinion, an efficient coal miner is a man who knows the mining laws of the district in which he works, be it bituminous or anthracite. A man who is always on the lookout for danger when going in or coming out of the mine, and who at once safeguards such danger by means of a suitable signal and proceeds to notify the mine foreman or assistant in charge, proves his efficiency in avoiding, as far as possible, mine accidents.

Again, the efficiency of a miner is shown when he carefully examines his working place before proceeding to load coal. Such a man never says, "Let us finish loading this car before setting that timber." If the needed post or timber is not on hand and he knows the place is unsafe he will quit at once and report to the mine foreman, after guarding the place from the entrance of anyone unwarned. An efficient miner will keep a sufficient supply of props, cap-pieces and rails on hand ready for use when needed. His place is always well timbered and he does not require to be told to do this, as is the case with many others. He keeps on hand a good kit of tools.

DIFFERENCE IN WORK PERFORMED ON TONNAGE BASIS AND DAILY WAGE

As stated by H. L. Handley, *Coal Age*, Sept. 9, p. 439, "There is a vast difference in the number of cars a man will load and the quality of the coal loaded when payment is made by the ton, as compared with the results obtained when the payment is by the day." This remark calls to my mind the difference between two miners who worked in similar places and had an equal turn of cars each day. Both were considered good miners, but one of them would always finish his day's work about two hours ahead of the other. Although the slower man was generally thought to be the better miner of the two, in my opinion the man who performed his work in the shortest time was more truly efficient, provided he observed the safety-first rules.

Another essential in the efficiency of miners is the disposition of a man to shoulder blame for his own shortcomings. The miner who admits, when something goes wrong in his place owing to an oversight or carelessness on his part and the boss comes around raising h——, that the fault was his own, and does not attempt to lay the blame to his laborer or somebody else, possesses one of the elements of efficiency in coal-mining work.

Finally, an efficient miner is one who can be called upon in an emergency to assist in timbering, tracklaying or other necessary work and, in case of accident, is cool-headed and courageous, understands what should be done and acts promptly in an emergency when it arises.

Carbondale, Penn. CYMRO.

Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 6—Where favoritism exists in any class of work and real merit in the worker is ignored, the effect is to practically eliminate the three essential features—efficiency, safety and economy—which are the chief elements of success in any operation or undertaking. True ambition in the worker is destroyed, and indifference and carelessness take its place. The result is a growing lack of efficiency that threatens every branch of the industry. Time and material are wasted and the company is robbed of its most important asset—the ambition of every worker to do his best.

When sensible men have a dollar to invest, they put it where, in their judgment, it will produce the largest returns. A mine manager is supposed to be a man of good judgment in the financing of mining operations, and the manager who does not consider merit first, last and all the time, robs the company whose interests are in his charge. Unconsciously or otherwise, he is encouraging similar tactics among his subordinates. When they are selected by favor, they are prone to use the same favor in the choice of the men they employ.

FAVORITISM IS ROBBERY

Stockholders are not the only ones who are robbed owing to favoritism being shown in the employment of men. The ambitious miner who has studied by lamp light while the favored ones slept, is robbed of his chances of promotion. Mine foremen, firebosses, daymen, pumpers, trackmen, timbermen, drivers and trapper boys all suffer because of favoritism shown to fellow employees.

Evidence of the effect of such favoritism is on every hand in most mining camps where men can be found who tell the old story of being set aside for another who had a pull with the man higher up. Ragged and barefooted children whose father was a good fireboss, trackman, or motorman, and who would have been well provided for but for some favoritism shown another who took the father's place, are the innocent victims.

I am pleased to think that our most successful managers, superintendents and foremen belong to the class that prefers to reward true merit wherever and in whomever it is found. Guided by a wise judgment, such officials choose for their subordinates men who merit promotion. Because favoritism is always shown at the expense of some poor unfortunate but ambitious worker, I conclude that any mine official granting such favors is little better than the vilest thief.

In this connection, we should guard against supposing that merit may not exist in a relative of the mine manager, superintendent or foreman. If so, such merit should be recognized and rewarded, though it may be difficult in such cases to give a wholly unprejudiced opinion or to exercise an unbiased judgment. Other things being equal, a man would naturally recognize merit in the friend who stood nearest to him, and his doing so could not be regarded as an injustice to the other man.

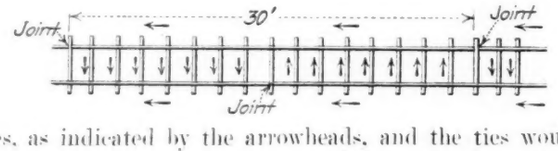
Dunbar, Penn. JOSEPH A. GREAVES.

Inquiries of General Interest

Steel Mine-Track Ties

Manufacturers of steel mine-track ties base their arguments for their use mainly on the saving in headroom and on the ability to recover and use the ties again.

It occurs to me that there is still another advantage that could be urged for the use of steel track ties in electric-motor haulage. I refer to the additional bonding of the rails that these ties would furnish if the rails in the track are laid so as to break joints; that is to say, the joints in one line of rails would fall about midway of the opposite rails. When so arranged, as shown in the accompanying sketch, the electric current returning through the rails would pass from rail to rail through the



ties, as indicated by the arrowheads, and the ties would thus furnish what might be styled a "supplementary bond."

I realize that more or less rust would occur on rails and ties, which would lessen the conductivity at each contact point; but at the same time the number of contact points for each rail would largely offset the imperfect contact between rails and ties.

It may be that main-line haulage roads, designed to be used for a number of years for heavy traffic, would still require being laid with wooden ties and bonded with copper bonds. However, it seems to me that feeder lines could well use the method I have suggested at a great saving of cost for bonding and the later expense of removing the bonds from the rails. The proposed method would also favor the extension of trolley-locomotive haulage into entries that are to remain open but a comparatively short time.

Unfortunately, our mines are not equipped for electric haulage, and I am unable to put this suggestion to a practical test. I hope that someone who is using electric haulage will be able and willing to give the suggestion a trial; or that manufacturers of steel ties will test the matter and acquaint us with the results obtained through the columns of *Coal Age*.

M. L. O'NEALE, Superintendent,
Coal City, Ala. Coal City Mining Corporation.

The suggestion made by this correspondent, in respect to track ties furnishing a supplementary bond or serving in place of a bond on a section of track that is laid temporarily as a branch of the main road, should receive the careful consideration of mine superintendents using electric haulage. Also, as suggested, the manufacturers of steel ties may be able to offer some valuable suggestions along this line. The purpose of the suggestion is to avoid the expense of bonding rails for a short time and later removing the bonds when the road is no longer in use. It also overcomes the ill effects of defective bonding, which is a frequent source of annoyance where a track is not well laid and ballasted. We shall be glad to have an expression of opinion in regard to the scheme proposed.

Dewatering a Mine

I am operating a small steam-coal mine, and am much troubled with water at a point 200 ft. from the bottom of the hoisting shaft. The coal has dipped here some 3 or 4 ft. below the shaft bottom, so that the water does not drain toward the shaft. The water is very strong in sulphur and quickly destroys both the pumps and pipes.

In order to handle this water, it has been proposed to drill a hole from the surface to this point in the mine where the water accumulates, and install a water hoist by running a rope from the drum of the hoisting engine over the surface to the drillhole. This would require 270 ft. of rope on the surface.

The hoisting engine is a duplex, 8x10-in. engine with a single drum. A 40-hp. boiler furnishes the steam for operating the engine. I have been told that the plan of hoisting the water in this way from the mine is wholly practicable, but before attempting its execution I would like to hear from *Coal Age* and its readers, in regard to what they consider the most feasible plan to adopt.

H. J. ROHR.

Alexis, Ill.

In order to answer this question intelligently, it is necessary to know the quantity of water the mine makes per hour or the amount that must be handled in the manner described. As we understand it the proposed plan contemplates the sinking of a drillhole of sufficient diameter to permit the water to be hoisted through the hole by a bucket especially designed to fill and dump automatically. We suppose that the rope used for hoisting this bucket is intended to coil on the same drum with the hoisting rope attached to the cages in the shaft. The scheme may be practicable, but, without knowing the depth of hoist, size of drum and other data such as the power required to hoist the coal, it would be impossible to give a definite answer to this inquiry.

It may be practicable, though probably not the best arrangement, to allow the rope hoisting the water in the drillhole to wind over the rope hoisting the coal in the shaft. Such an arrangement has been used at times, although causing considerable wear, owing to the chafing of the two ropes when one winds over the other.

It is assumed that it is the intention in this plan to hoist water at the same time that coal is hoisted. As stated previously, the bucket would have to be arranged to fill and dump automatically. In order that the metal may resist the corrosive action of the water, the bucket should be made of the best quality of wrought iron. It may also be necessary to incase the hole with wrought-iron tubing. We shall be glad to hear from others on this subject.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—What is the indicated horsepower of a 10x16-in. engine, making 225 r.p.m., the mean effective pressure in the cylinder being 60 lb. per sq.in.?

Ans.—The sectional area of a cylinder 10 in. in diameter is $a = 0.7854 \times 10^2 = 78.54$ sq.in. The length of stroke being 16 in., or 1⅓ ft., and the number of strokes $2 \times 225 = 450$ per min., the indicated horsepower, for a mean effective pressure of 60 lb. per sq.in., is given by the formula

$$I.hp. = \frac{plan}{33{,}000} = \frac{60 \times 1\frac{1}{3} \times 78.54 \times 450}{33{,}000} = 85.6+ hp.$$

Ques.—How many revolutions per minute is an engine making when the piston speed is 600 ft. per min. and the stroke 30 in.?

Ans.—The number of revolutions per minute is found, in this case, by dividing the piston speed, in feet, by twice the length of stroke, in feet, since the engine makes two strokes in each revolution of the crank. Here, twice the length of stroke, in feet, is $2(30 \div 12) = 5$ ft. Hence, the speed of this engine is $600 \div 5 = 120$ r.p.m.

Ques.—Find the piston speed of an engine making 160 r.p.m., and having a stroke of 24 in.

Ans.—Since the engine makes two strokes during each revolution of the crank, the distance the piston travels is $2 \times 24 = 48$ in., or 4 ft. in a single revolution of the engine and the piston speed is therefore $4 \times 160 = 640$ ft. per min.

Ques.—What is the length of stroke of an engine having a piston speed of 750 ft. per min., at 250 r.p.m.

Ans.—In a single revolution of the crank the piston of this engine travels $750 \div 250 = 3$ ft., or 36 in. and the length of stroke is therefore $36 \div 2 = 18$ in.

Ques.—How high must a chimney be to give the necessary draft to burn 15 lb. of coal per square foot of grate surface per hour?

Ans.—An approximate rule that is sometimes used makes the height of the chimney in feet equal to the square of one-half the weight in pounds of coal burned per square foot of grate per hour, plus 1. This rule may be taken as applying approximately to the burning of the larger sizes of anthracite. For the smaller sizes of anthracite the height must be somewhat increased, and for bituminous coal containing less than 5 per cent. ash the height may be somewhat less than that given by the rule. Thus, to burn 15 lb. of anthracite per square foot of grate per hour would require an approximate height of

$$h = \left(\frac{15 + 1}{2}\right)^2 = 64 \; ft.$$

For the smaller sizes of anthracite this height may have to be increased to, say 70 or 75 ft., while for a good quality of bituminous coal a height of 60 ft. may be sufficient.

Ques.—How high must a chimney be to supply draft for a nest of five boilers of 50 hp. each when burning bituminous coal at the rate of 4 lb. per hp. per hr., the draft being such as will burn 12½ lb. of coal per square foot of grate surface per hour; and what will be the grate area required under each boiler?

Ans.—The height of chimney required to burn coal at the rate of 12½ lb. per sq.ft. of grate surface is given approximately by the formula

$$h = \left(\frac{12.5 + 1}{2}\right)^2 = 45.5 \; ft.$$

If each boiler burns 4 lb. of coal per horsepower per hour, the weight of coal burned in each furnace will be $4 \times 50 = 200$ lb. per hr. The draft being sufficient to burn 12½ lb. of coal per square foot of grate surface, the area of grate under each boiler will be $200 \div 12.5 = 16$ sq.ft.

Ques.—A boiler 48 in. in diameter is subjected to a pressure of 100 lb. per sq.in. If the boiler plate is ⅜ in. thick, what is the stress per square inch in the shell?

Ans.—The unit stress in the shell, due to this pressure, is found by multiplying the diameter of the boiler in inches by the pressure in pounds per square inch and dividing by twice the thickness of the boiler plate, in inches; thus,

$$S = \frac{100 \times 48}{2 \times \frac{3}{8}} = 6{,}400 \; lb. \; per \; sq.in.$$

Ques.—The indicated horsepower of an engine is found to be 175 hp. If its mechanical efficiency is 85 per cent., what is the actual horsepower of the engine?

Ans.—The actual, or effective, horsepower in this case is $0.85 \times 175 = 148.75$ hp.

Ques.—When 9,000 cu.ft. of air is passing through a regulator per minute, and the difference of pressure on the two sides of the brattice is equal to 0.7 in. of water gage, how far is the regulator shutter open, assuming the opening is 1 ft. in depth?

Ans.—The area of opening in this regulator is given by the formula

$$A = \frac{0.0004Q}{\sqrt{w.g.}} = \frac{0.0004 \times 9{,}000}{\sqrt{0.7}} = 4.33 \; sq.ft.$$

If the depth of the opening is 1 ft., its width must be 4⅓ ft., or 4 ft. 4 in.

Ques.—The air current in a mine is charged with 1.5 per cent. of marsh gas and the water gage reads 1 in.; what will be the percentage of gas in the air current if it became necessary to reduce the speed of the fan so that the water gage would read ½ in.?

Ans.—Since the quantity of air passing varies as the square root of the water gage, the ratio of the quantity will be equal to the ratio of the square roots of the water gage readings, which is $\sqrt{1.5} : \sqrt{0.5}$, or $\sqrt{3} : \sqrt{1}$, or 1.73 : 1, or 173 : 100. In other words, for every 100 cu.ft. of air passing, after the speed of the fan has been reduced, there was 173 cu.ft. in the original current. The percentage of gas after reduction is therefore $1.5 \times 173/100$ = say 2.6 per cent.

Coal and Coke News

HARRISBURG, PENN.

All data relating to the reporting and classification of mine accidents, and reports of tonnage, number of employees, kinds of machinery, etc., will be standardized in the future in this country as a result of a meeting at the Hotel Strand, Atlantic City, of the committee of state and Federal mining officials. This committee was headed by James E. Roderick, chief of the department of mines of Pennsylvania.

The committee of which Mr. Roderick was made chairman was appointed at a conference of state and Federal officials in Washington, D. C., last February. It assembled at the request of the Secretary of the Interior to study the methods of making reports of mine accidents in the various states, including the classification in vogue, with a view of adopting for all the states a uniform system of making reports that will be complete and comprehensive and make possible a comparison of conditions in the different states.

The coal-mining industry was represented by James E. Roderick, chief of the department of mines of Pennsylvania, and James Dalrymple, chief inspector of mines of Colorado; the metal-mining industry was represented by George H. Bolin, state mine inspector of Arizona and W. B. Oren, state mine inspector of Montana. The other members of the committee were L. W. Hatch, chief statistician, New York Industrial Commission, John Bohlander, president, Illinois State Mining Board, and Albert H. Fay, mining engineer of the Federal Bureau of Mines.

In order that the statistics relative to accidents may be of the greatest value to the mining industry at large, it is planned to collect and tabulate them on a standard basis. With the introduction of compensation laws, it is essential that accurate and reliable data be available in order that proper insurance rates may be established. Furthermore, uniform and complete details offer the mine inspectors, miners, operators and all others interested an opportunity to make a true comparison of conditions as they exist in the different states.

The committee will make its report to the director of the National Bureau of Mines, who will endeavor to have the various states adopt the forms and methods as worked out by the committee.

Earnings Are Large

With the annual report for the fiscal year made public on Sept. 22, the Reading Co., one of the three corporate defendants named in the suit brought by the Government in the United States Supreme Court on an appeal from the United States Cicuit Court of Appeals, is shown to have earned a surplus of $14,226,467, or 20.32 per cent. on its common stock of $70,000,000. The subsidiaries, the Philadelphia & Reading Railway Co. and the Philadelphia & Reading Coal and Iron Co., also filed reports.

The coal report is a criticism of the Common Pleas Court for its decision in a case against the corporation. The suit was brought in the Common Pleas Court of Philadelphia County against the company seven years ago by Hugh Bellas, who died since the case was entered.

The interesting information that the workmen's compensation act has killed the Miners' and Laborers' Beneficial Fund is also disclosed. This fund, which was in existence 40 yr., was rendered unnecessary, the company states, since the coal corporation accepted the provisions of the new law.

It is understood that following the plan in the original suit counsel for the Reading Co. and its subsidiaries will make a general denial of all the allegations that charge violations of the anti-trust code. However, the Federal Government in this new brief charges specifically rebating that can be punished criminally, and this is made a part of the civil case.

In connection with the appeal is an analogous situation involving the Government and the United States Steel Corporation. This suit also was dismissed by the Circuit Court which dismissed the Reading suit, on the ground that there had not been sufficient evidence adduced to show that the corporation was a trust in restraint of trade and that it had created a monopoly. This case, too, has been carried to the Supreme Court of the United States on an appeal similar in many respects to the action in the coal cases.

In the decision, however, the District Court Judges held that the Lehigh & Wilkes-Barre Coal Co. received rebates from the Central R.R. of New Jersey. It enjoined the railroad company from giving any more rebates and authorized the existing relations to be severed. In the first case, the railroad company was fined $200,000 and the case was appealed.

After the decision by the Court of Appeals the Lehigh Coal and Navigation Co. was brought to trial and fined $100,000 for receiving rebates. The Central R.R. of New Jersey paid its fine, but the Navigation company's case has been appealed.

Gross earnings of the Philadelphia & Reading Coal and Iron Co., expanded more than $6,000,000, the total revenues being $36,603,759. The total profits after meeting expenses and interest payments, were $1,280,048, against only $60,572 in the previous year.

It is learned here, that United States Attorney General Gregory, in submitting to the Supreme Court the Government's appeal from the lower court's decision of the anti-trust suit against the Reading and its subsidiaries will ask that the defendant individuals and corporations be required to submit to the District Court of Eastern Pennsylvania a plan for dissolution. If they fail to do this, or if their plan is rejected by the District Court, the Government will ask that effect shall be given to the requirements of the anti-trust statute through appointment of a receiver, or by enjoining the movement of the defendant's products in interstate commerce.

The Reading case will be one of the first, if not actually the first, taken up when the Supreme Court convenes Oct. 10. It will be the first to be argued before a full bench, on which Justice Brandeis and Justice Clarke have been placed since the adjournment early in the summer.

Compensation Law Is Criticised

At the 63rd annual meeting of the Medical Society of the State of Pennsylvania, held on Sept. 19, 20 and 21, the present compensation law came in for a severe grilling, especially as it affects physicians and the practice of medicine.

Four recommendations for actions of the association were suggested. These contemplate making the period of treatment following an accident 30 days, instead of 14 as under the present law; increase the maximum compensation for major operations from $75 to $200, and for minor operations from $25 to $100; and an amendment to the law which will define what is a minor and what is a major operation.

This distinction, at the present time, it was said, is made by laymen who know nothing of surgery or medicine, and frequently is an injustice to the physician in the matter of remuneration for his service.

The physicians claim that efforts have been made from an outside source to interpret the law in such a manner as to interfere with medical judgment and jeopardize life and place a commercial value where none should exist.

Many of the laws they argued are unsatisfactory and need to be amended. The agitation which is being systematically brought to obtain legislation for those cases not provided for under the compensation law will probably result in the State Department of Health taking over the entire care of these patients.

At the next session of the legislature a so-called health and industrial insurance act will be introduced. It is intended to cover all cases not included under the workmen's compensation law.

Indications are that the medical association will take drastic steps in an effort to bring to the attention of the next Legislature the several amendments they think should be enacted to make the law fair to them. These recommendations were made in the face of demands by the miners' organization, formulated at the Freeland convention, and which will be backed by the other two anthracite districts and the bituminous districts, that the period of medical attention should be shortened from 14 days to 3 days and the compensation increased in amount, beginning with the 4th day of disability instead of the 15th.

Social insurance, to protect the family working for small wages, was advocated by several speakers of the State Medical Association. The principal speaker on this subject was Dr. John Price Jackson, Commissioner of the State Department of Labor. Doctor Jackson referred to the social insurance plan which was in effect in other countries. He intimated that the state administration has been studying these plans, and that at the next session of the Legislature a bill will be proposed touching upon the subject. The objection to the compulsory health insurance would be the tendency to take away from American people their ability to care for themselves—their self-reliance.

On the question of occupational diseases, under which the miners claim miners' asthma and probably tuberculosis, will be listed, Commissioner Jackson says the serious difficulty to be encountered, is to determine just what constitutes occupational disease.

PENNSYLVANIA

Anthracite

Locust Gap—Orders were received on Sept. 20, by the officials in charge of Locust Gap colliery, operated by the Philadelphia & Reading Coal and Iron Co., to have the washery at that place placed in readiness for immediate resumption. The operation was closed last February.

Jessup—A fire broke out in a fan house at the mine operated by the Mt. Jessup Coal Co. on Sept. 20, and 200 miners and laborers, working in one vein supplied with air by the fan, hurried to the surface. Company officials have so far been unable to determine the cause of the fire. Other sections of the mine were shut down as a precaution and all the men were gotten out safely.

Hazleton—It is reported that the Lehigh Valley Coal Co. has decided to abandon its Hazleton No. 1 and the Hazle mine breakers. Hazleton shaft will prepare the coal from both mines, while that from Eckley mines will be prepared at the Drifton breaker.

Scranton—Two more coal companies filed their appeals on Sept. 22, from the action of the county commissioners in assessing coal land in Lackawanna County, at $325 per foot-acre. The appeals were filed by the Scranton Coal Co. and the Elk Hill Coal and Iron Co. They are identical with those filed on Sept. 18 by a number of the big companies in the county. They ask that the court fix the rate of assessment at $100 per foot-acre, which is $50 less than the assessment fixed by the court in 1907.

Shamokin—Miners' houses between Hacksherville and Greenbury, on a tract of about 600 acres, are to be torn down and the cultivated fields abandoned, because of the danger of mine caves. The Philadelphia & Reading Coal and Iron Co., which has ordered the abandonment of these houses, will erect 80 new dwellings to take their place on safe territory. The tract in question is underlain by the Mammoth vein.

Bituminous

Johnstown—The Ramsey Coal Co. has completed a new mine between Ligonier and Wilpen, and has begun the shipment of coal. Fifty miners are at present employed.

Pittsburgh — Twenty-seven fleets of barges, towed by as many boats, recently left Pittsburgh for the markets of the Ohio and Mississippi valleys. The aggregate measurement of this shipment was approximately 7,000,000 bu. of coal.

The car shortage in the Pittsburgh and adjacent territory is reported by shippers and railroad men to be the worst known, the railroads, associations of shippers and the Interstate Commerce Commission have sent out many circulars to consignees, urging speed in releasing the cars. The coal mines of western Pennsylvania are unable to operate full time on account of the car shortage, although orders are pressing.

Connellsville—The coke production for the week ending Sept. 16 aggregated 393,447 tons, of which the merchant operations produced 154,538 tons, and the furnace interests 238,909 tons. The region operated for six days per week. Compared with the previous week, this showed a gain of 9073 tons.

WEST VIRGINIA

Charleston—Lack of mining operatives in the Norfolk & Western districts has become so acute that operators are unable to fill their orders. An effort is being made by representatives of the mines at Eccles and Sun to at least temporarily alleviate this shortage. It is said that scarcity of labor throughout the state is unprecedented. This is applicable to artisans of every class.

The Wyatt Coal Co. is opening 8 new mines and building 8 mi. of track, also building 8 new tipples. The company will ship coal from the first of the tipples completed some time in December, and the rest will be completed later. Contracts have already been placed for steel and ties for the track, and orders have been made for machinery, mine locomotives, cars and equipment generally, to the amount of $500,000.

Many mines in the Elk River coal field are in operation for the first time in several months, and a general resumption of coal plants in that field is expected, because of the approach of what is believed will prove a heavy winter trade.

Cameron—Options have been taken during the recent past on coal land in this vicinity. A few small pieces are to be found here and there which the owners have refused to option, waiting for a price which suited them. For some time it looked as if the market for coal land would not revive, but there has been some stir in it in the past few days. The price offered at present is $65 per acre.

Dorothy—The mines of the Four States Coal Co. will soon resume operations, as the railroad will have its line open as far as Cabin Creek Junction. The tunnel will also be opened shortly.

Thomas—The "Employees' Magazine," issued by the Davis Coal and Coke Co., is proving popular among its employees and the company feels justified in its issue. The October number contains 40 pages, with illustrations.

Raleigh—The Raleigh Coal and Coke Co. is rushed with orders and has recently placed in operation three Jeffrey arc-wall coal-mining machines.

Mt. Pleasant—Eight hundred thousand bushels of Kanawha coal recently left the Kanawha River in tow of six boats for Cincinnati. Most of the coal is slack, which is used for steam raising, and the supply of which has been exhausted in Cincinnati for some time.

ALABAMA

Birmingham—There has been a large exodus of both white and colored labor from this district in the past few weeks destined for the coal fields of Kentucky and Virginia and northern industrial fields.

KENTUCKY

Madisonville—M. R. Cardwell, of Central City, Ky., is making preparations to reopen the White Plains mine.

Hazard—Coal operators around Hazard report a slight car shortage that has considerably affected business. Some mines are only operating from three to four days a week. The railroads, however, promise an improvement over present conditions.

Whitesburg—Coal operators of the Elkhorn and Boone's Fork fields of Letcher County report a serious car shortage and mines running short hours in some instances. Railroads, however, promise an improvement in conditions at once. Other sections of the eastern Kentucky coal fields are also affected.

Lexington—Development of the large holdings of the Elkhorn Mining Corporation on the left fork of Beaver Creek, in Knott County, it is said will be begun at once and conducted on a large scale.

Earlington—Coal mines in this section are still unable to operate full time on account of a shortage of cars on the Henderson division.

OHIO

Columbus—Efforts are being made by the mining school of the Ohio State University to have the Ohio mine rescue car park on the university spur, when not in use. At present it uses the railway yards, where it is shunted about at will by the switch engines, and when needed several hours are sometimes required to dig it out. Aside from the prompt availability of the car if kept on the university spur, the crew of the car would receive the benefit of free instruction at the mining school during their idle time.

Athens—In line with its plan of reorganization, the holdings of the Continental Coal Co., in Athens, Hocking and Perry Counties, will be sold at public auction in Athens, November 9 next. The sale follows foreclosure proceedings brought by the Guarantee Trust Co., of New York, trustee for the company which is the largest in the Hocking fields. It controls 14 mines, has a daily output of 10,000 tons and employs 4,000 men. Under the name of the Continental Mining Co., the property has been operated by N. D. Monsarratt, mining engineer, as receiver since last March. It was idle for over a year. The output has been sold through the George M. Jones Co., which has opened a sales office in Columbus. Many of the mines are among the most important in the Hocking Valley field.

ILLINOIS

Middletown—The sale by the sheriff of the Middletown Coal Co.'s mine and six and a quarter acres of land broke the low-price record. The property was bid in by Edward Rayburn for $87. The back taxes are $300, so the state stands to lose $213. The mine has been abandoned Rayburn will not reopen it. When the mine was opened several years ago great expectations were entertained. It is said that $200,000 had been invested in the mine.

Springfield—Information received at miners' headquarters here is that steady work with a shortage of men is probable in some sections of the state with the increased activity about the mines. It is expected that the mines will be operated at capacity until Feb. 1, after which they will drop to half or quarter time. Shortage of cars is the only thing that is feared. In the northern part of the state a shortage of men is reported.

The mine of the Tuxhorn Coal Co., three miles east of here, on the C., I. & W. R.R., has resumed operations. A special train will be run from Springfield during the winter to carry the men to the mine. It has been closed since Mar. 15. It employs about 200 men.

A two days' session of Joint Group Board No. 3, composed of members of the miners' and operators' boards from the sixth and seventh districts, was held this week at the rooms of the Illinois Coal Operators' Association. Cases from Saline, Franklin and Williamson Counties, which had been referred, were taken up.

Benton—The Hart-Williams mine, recently acquired by the Taylor Coal Co., of Herrin, is being put in condition for opening after having been closed down for 18 mo. It will give employment to about 600 men and will be known as Taylor Mine No. 6. When all the mines of the company are in operation, the output will be about 200 cars, 9,000 tons, daily.

Carlinville—The Carlinville Coal Co. is erecting a 100-ton coal bin for the storage of coal for local use during the winter. The coal will have two screenings, one before it reaches the bin and another when it is taken out for delivery. The machinery has been received and the work is progressing.

ARKANSAS

Fort Smith—The Johnson County property of the Scranton Anthracite Coal Mining Co. was recently sold at foreclosure sale to satisfy a judgment obtained by the Scranton Trust Co., holder of the coal company's bonds. Heber Denman, of McAlester, Okla., purchased the property for $45,307.95, which included the trust company's judgment of $42,000, costs, allowances and other expenses.

NORTH DAKOTA

Wilton—The Washburn Lignite Coal Co. has practically completed its new tipple at Mine No. 2, and will shortly be able to ship coal from this plant. This mine will have a capacity of 2,500 tons per day. Indications are that more North Dakota lignite will be burned this winter by the people of the state than ever before.

Foreign News

Copenhagen, Denmark—Coal of high calrific value, almost equal it is said to that of England, is beginning to arrive at Reykjavik from the mine recently discovered in Iceland. It is expected that this mine will yield 200,000 tons annually.

Personals

C. B. Young, who has been connected with the United Fuel Gas Co. as civil engineer, has accepted a position with the Boone Coal Land Co. near Sharples, W. Va.

F. E. Herriman, coal traffic manager of the New York Central Lines, has returned to his desk after a long absence due to a fractured hip received last January from a fall. Mr. Herriman has to use crutches to get about but expects that he will be able to do away with them shortly.

Henry Stark, employed as mine foreman for the M. S. Kemmerer Coal Co., for a number of years, has tendered his resignation to accept the superintendency of the Pond Creek Coal Co., which is now controlled by an independent Scranton concern. This company will shortly resume operations.

F. M. Cook, formerly superintendent of the Winding Gulf Collieries Co. and president of the Beckley Smokeless Coal Co., has taken over the City Coal Co., owned by D. H. White, at Beckley, W. Va. Mr. Cook will devote all of his time and efforts to the development of the property acquired from Mr. White.

Edwin J. Lafferty, of Philadelphia, was, on Sept. 23, appointed by Governor Brumbaugh, a member of the commission to investigate the increase in the price of anthracite coal, to succeed the late C. Tyson Kratz, of Norristown. The other members of the commission are R. S. Gawthrop, of West Chester, and John Langdon, of Huntingdon. Mr. Lafferty is secretary and treasurer of the E. A. Wright Bank Note Co.

Obituary

James Hutton, 51 years of age, a prominent labor leader, was instantly killed by a fall of rock at the William Penn colliery, near Shenandoah, Penn., on Sept 21. His son Thomas, working with him, escaped unhurt.

I. G. Roby, aged 59 years, and a mine inspector of the Fifth Pennsylvania District since 1900, died recently in his home in Uniontown, Penn., from heart disease. Mr. Roby went to work in the mines of Fayette County while a boy. He was determined, however, to gain an education, and had a vision of the wonderful opportunities that the region offered him. He began studying during his spare time, taking a correspondence course in mining and using his powers of observation to the utmost. He pushed ahead, being superintendent of the Penn Coal Co.'s property at Smithfield when appointed to the position which he held continuously until his death. He became a well known authority on mine explosions, and it has been stated that he has located more dead bodies of miners after explosions than any other man in the state. Mr. Roby is survived by his wife, nine children, two brothers and two sisters.

Eckley B. Coxe, Jr., whose family were pioneers in coal production, a patron of science and a man who expressed his loyalty for his alma mater by giving hundreds of thousands of dollars for its scientific work, died on Sept. 20, at his summer home at Drifton, Penn. Mr. Coxe was 44 years old, and was noted for his work for the museum of the University of Pennsylvania. He financed and equipped five expeditions into Egypt in the pursuit of the archeological work of the institution, and assumed the expense of the museum for years, in order that funds obtained elsewhere might be devoted to the purchase of collections of interesting objects and data. Mr. Coxe's family were among the first to produce anthracite coal, and were the largest independent coal operators of the anthracite region, prior to selling out their holdings to the Lehigh Valley Coal Co., a few years ago. Through the kindness of Mr. Coxe and his relatives, they became benefactors of the whole region around Drifton. Their Christmas parties are famous. Every child in Drifton is always a guest at the big Christmas parties given by the family. Clothing, toys, candy and good things to eat are always among the gifts and Mr. Coxe took great pleasure in this work in the mining towns. Mr. Coxe made his home with his mother, he being unmarried. He was one of the founders of the University of Pennsylvania Museum, and in 1910 became its president. He was one of the chief officers of the Pennsylvania Archeological Society, and also a member of the International Society.

Industrial News

Louisville, Ky.—The Wooldridge Jellico Coal Co. has reduced its capital stock from $300,000 to $60,000. Powhattan Wooldridge is president.

Red Ash, Ky.—The Stines Coal Co. was recently organized with a capital of $1,000. The incorporators are M. A. Stines, Lewis Francis and Thomas Francis.

Erie, Penn.—The Canadian coal barge, "Rob Roy," recently sank northeast of this port after attempting to turn about and put into the harbor. All of the crew were saved.

Wellsburg, W. Va.—The West Virginia-Pittsburgh Coal Co. is spending about $10,000 at Colliers on a steel coal tipple, in building a railroad and erecting a moving picture theater.

Amsterdam, Holland—It is reported that a general strike of miners throughout the Belgian coal field is in progress. The miners ask increased wages commensurate with high food prices.

Birmingham, Ala.—The Winona Coal Co. has been incorporated with $10,000 capital to do a mining business. Incorporators are J. P. Demmick, E. P. Randle and A. B. Aldridge.

Pineville, Ky.—The White Log Jellico Coal Co., of Pineville, was recently organized with a capital stock of $20,000. The incorporators are M. F. Whitehill, D. B. Logan and B. F. Logan.

Johnstown, Penn.—The Blair-Cambria Coal Co. on Sept. 22 filed a mortgage for $100,000. The mortgage is in favor of the Casualty Co. of America and covers coal lands in Dean Township.

Terre Haute, Ind.—The Index Coal Co. was recently organized for the purpose of mining coal, with a capital stock of $10,000. The directors are John Hewitt, John Boyle, and H. W. Moore.

Rockford, Penn.—John Lechrie, of Windber, has added to his coal holdings in the Cairnbrook-Central City mining field by securing a lease on 1,100 acres belonging to Ex-Judge Mahlon Keim, of Johnstown.

Rush Run, Ohio—The Beech Flats Coal Co. will soon have its second big shovel ready for work, and with two loading shovels it will be able to double its output of coal, making about 30 to 35 cars per day.

Canton, Ohio—The Huff Run Coal Co. has been incorporated with a capital of $20,000 to mine and sell coal. The incorporators are B. F. James, August Heinman, Grace M. James, Albert Ess and Albert Heinman.

Webster Springs, W. Va.—The Laurel Hill Mining Co. has begun operations on a 300-acre tract of coal at Arcola. This firm will install new and up-to-date mining machinery, this plant being the second one in the county.

Connellsville, Penn.—D. J. Lynch & Co. has been incorporated with a capital stock of $5,000 to mine coal in Somerset County. The incorporators are Bernard A. Lynch, Robert L. Linton and J. G. Weakland, of Meyersdale.

Sacramento, Calif.—A ton of blacksmith coal was recently shipped from here 75 mi. inland by parcel post. It was packed in sacks of 50 lb. each and distributed over a period of four days. The postage amounted to $21.98.

Pittston, Penn.—The Lehigh Valley Coal Co. is making extensive repairs at the Seneca colliery. The Coxey shaft is being concreted to the rock strata and a steel tower is replacing the old wooden headhouse at the Twin shaft.

Philadelphia, Penn.—The Panama Coaling Co. has been organized with a capital of $250,000 to acquire coal lands and develop them. The incorporators are Herbert E. Latter, D. L. Rimlinger,

of Wilmington, Del., and Clement M. Egner, of Elkton, Md.

Clarksburg, W. Va.—The Big Run Coal Co., of Baltimore, is opening a new coal mine near Century on the Grafton & Bellington R.R. This mine will have a daily capacity of 1,500 tons and will employ about 300 men. It is expected to be in operation in 90 days.

Pottsville, Penn.—There is a rumor that the Lehigh & New England R.R. intends to enter Pottsville by extending its tracks from Tamaqua, and connecting with the Pennsylvania at this place, thus securing a portion of the heavy traffic and coal tonnage from this locality.

Birmingham, Ala.—The Alabama Safety Association will hold its annual meeting in Birmingham, Oct. 14. James L. Davidson is president of the association. The association was organized in 1908. Foremen from every mine in Alabama have been invited to be present.

New York, N. Y.—A New York contracting firm has been awarded the contract for stripping the earth from a bed of coal in Tulsa County, Okla., and mining the coal with steam shovels, loading directly into cars. The contract involves $2,000,000 and will consume five years to complete.

Fairmont, W. Va.—The South Pittsburgh Coal Co., organized by Marshall Jollife, J. W. Poling, Seymour McIntyre, Bruce Hite and M. W. Ogden, of Fairmont, is developing a tract of 140 acres of coal land at Round Bottom, in Monongalia County, West Virginia, on the Monongahela R.R.

Washington, D. C.—Fourteen coal-mining companies of southern Ohio recently appealed to the Interstate Commerce Commission to establish new rates on coal to Indiana and Michigan that would be proportionate to the distance as compared with rates from Kentucky, West Virginia and Tennessee.

Boston, Mass.—The owners of the four-masted schooner "Edward H. Cole" have chartered her to load a cargo of 2,000 tons of coke at Baltimore for delivery at Barcelona, Spain, at a freight rate of $28 per ton. This charter is the most profitable of its kind that has ever been concluded.

Huntington, W. Va.—Coal operators from the eastern Kentucky fields state that operations there are being hampered by a shortage of cars. There is a strong demand for coal, but so few cars have been furnished that in some instances mines have been able to operate only two days per week.

Whitesburg, Ky.—Letcher County's forest fire prevention organization has begun its winter's work, with two lookout stations established by the Consolidation Coal Co., near Jenkins, manned continually. Both are connected with the city exchange and local deputy wardens are being appointed.

Charleston, W. Va.—The By-Product Coal Co., of Huntington, was recently incorporated to operate in Letcher County, Kentucky. The authorized capital is $50,000, and the incorporators are Frank Enslow, Jr., J. C. Garret, C. B. Baldwin, M. M. Bothwell and J. W. Hagen, Jr., all of Huntington, W. Va.

Fairmont, W. Va.—At a meeting of the stockholders of the William Penn Coal Co. the following officers were elected: John A. Clark, president; A. R. Watson, vice-president; G. P. Purcell, secretary; A. H. Kane, treasurer. The company has leased 1,400 acres of coal in Harrison County, and will start development at once.

Philadelphia, Penn.—The four-masted schooner "J. Holmes Birdsall," of Philadelphia, laden with coal, was washed on the rocks at the entrance to the harbor at San Juan, Puerto Rico, on Sept. 19, by a ground swell and was abandoned by her crew. The loss will reach $200,000 and is covered by insurance.

Washington, D. C.—Tariffs of the Denver & Salt Lake R.R., which would effect an increase in freight rates on bituminous coal from the Oak Hill district in Colorado to points in Kansas, Nebraska, Missouri and Iowa, were recently suspended by the Interstate Commerce Commission until Jan. 26, pending investigation.

Pittsburgh, Penn.—Coal and coke shipments over the Pennsylvania R.R. lines east of Pittsburgh for August amounted to 6,467,709 tons, an increase of 741,232 tons compared with those of 1915. From Jan. 1 to Aug. 31, the tonnage amounted to 50,026,460, a gain of 8,289,252 tons over the corresponding period of last year.

Dallas, Texas—The city pumping plants, incinerators and power plants are now burning coal instead of gas and fuel oil. During the recent threatened railroad strike the city purchased several thousand tons of coal for use in case of emergency and the boilers have been changed temporarily to coal while this supply is being used.

Russellville, Ky.—Russellville has been upheld by the State Railroad Commission in its contention that it should enjoy the same rates on coal shipments as Hopkinsville, another southern Kentucky town. The commission investigated rates in Ohio, Indiana and Illinois and reached the conclusion that rates to these Kentucky towns are higher.

Harrisburg, Penn.—School districts were instructed on Sept. 18, to file with the State Department of Public Instruction plans for the operation of continuation schools during the coming term. All districts in which minors between the ages of 14 and 16 are employed, must maintain such schools, unless fewer than 20 young people are eligible.

Fairmont, W. Va.—It is reported that the Monongahela Ry. is to be extended from Fairmont to Belington, via Clarksburg, to connect with the Western Maryland and the Coal and Coke lines. The proposed line would open a rich coal field in Marion, Harrison and Barbour Counties, which has for years been awaiting transportation facilities for development.

Harrisburg, Penn.—Mayor Lewis Frank, of Johnstown, Penn., as an official and as a private citizen, recently protested to the Public Service Commission against an advance of domestic-coal rates by the Johnstown Fuel Supply Co. The appeal is similar to that taken by the Cambria Steel Co. against the same corporation for an increase in industrial rates.

Whitesburg, Ky.—It is currently reported here that the Interstate Coal and Lumber Co., of Elkins, W. Va., has closed a deal for 15,000 acres of practically virgin timber land on Middle Fork and Greasy Creek, in Leslie County. A survey is being run for a narrow-gage railroad from a point on the Louisville & Nashville and development work will begin shortly.

Pittsburgh, Penn.—The Asbestos Protected Metal Co. announces that William H. Cummings, formerly of Providence, R. I., has become associated with its Waugh glazing department. Mr. Cummings has had much experience in sheet metal and skylight work and it is expected that his acquisition will expedite correspondence, estimates, etc., as well as actual production.

Dewar, Okla.—The Morgan Coal Co. has been organized here and a charter has been granted by Secretary of State Lyon at Oklahoma City. The company has a capital of $30,000, and the incorporators are: E. B. Morgan, Dewar; E. R. Jones and L. W. Randolph, Muskogee. The company will conduct a coal-mining business and also a sales agency for retail distribution.

St. Louis, Mo.—The Board of Public Service approved recently the plans for the permanent municipal docks to be erected at the foot of North Market St. The estimated cost is $200,000. They are to be finished in six months. They will be of concrete, set upon wooden piling, with a wooden "bumper" against which boats will land. They will be 900 ft. long. The bids will be opened Sept. 29.

Seco, Ky.—The South East Coal Co. will build about 100 miners' houses about midway between Kona Station and Laviers, according to an announcement, where many miners will reside who work at Laviers. Building ground is limited at the latter place, and the company lately changed its plans and will now build at the new location which is one mile above Laviers and one mile below Kona Station.

Connellsville, Penn.—A charter was recently granted to the Connellsville-Indian Creek Coal Co. with an authorized capital of $6,000. The incorporators are H. A. Porter, K. K. Kramer and J. M. Grey, all of Connellsville. The operations of the new firm will be located between Mill Run Junction and White's Bridge on the Indian Creek Valley R.R. Preliminary work is now in progress with a view to making a mine opening and erecting a tipple in time to begin coal shipments this fall.

Huntington, W. Va.—For the 5th time in the history of the Norfolk & Western Ry., the monthly shipments of coal passed the three-million-ton mark in August. During that month 3,048,940 tons of coal were carried by the road, 2,493,711 tons being from fields directly along the company's route. August shipments exceeded those of June, which amounted to 3,045,550 tons. The record of the road is 3,094,208 tons carried in May of this year.

New York, N. Y.—At a regular meeting of the board of directors of the Maryland Coal Co. (of Maryland) and the Maryland Coal Co. of West Virginia, held at the offices of the company, No. 1 Broadway, New York City, N. Y., on Wednesday, Sept. 20, 1916, Gordon Smith, of Baltimore, was elected second vice-president and to membership on the Boards of both companies. Mr. Smith will continue to make his headquarters in the Baltimore office of the company, which is located in the Munsey Building.

Portsmouth, Ohio—The towboat "George Matheson" with a big fleet of coal ran aground at Bonanza Bar recently, scattering the fleet and sinking one barge. The towboat "J. T. Hatfield" ran a half a dozen of its coal barges aground near the Government dam just below Portsmouth, and in trying to get them off sunk one of the barges. The loss to the Hatfield company will run into the thousands, and all available derrick boats in this vicinity were put into service in an effort to raise the sunken barges.

Columbus, Ohio—Because its mine in Perry County was destroyed by fire two years ago as the result of a blast igniting coal, which had been saturated by oil drippings, the Rock Run Coal Co. was recently awarded a jury verdict of $50,000 damages. The coal company alleges it had been mining coal under a 29-acre tract on which the oil company had drilled gas and oil wells, and that so much oil leaked from the tubing and permeated the coal that it was easily ignited by the blast. The fire spread throughout the mine, completely gutting it and making it useless, it was represented.

Philadelphia, Penn.—Coal barges now bring ties from the yellow-pine forests of the South to the Lehigh Valley R.R. Scarcity of vessels and high water rates led the Lehigh Valley to make an experiment of general interest to railroad men. The sea-going tug "Perth Amboy" was sent south with three modern steel coal barges. These barges were placed at Brunswick, Ga., and Jackson, Fla., where the ties are easily concentrated; and a load of 50,000 ties was quickly obtained. The tug experienced no difficulty in bringing the tow back to Perth Amboy, where the ties were loaded on cars for transportation along the line of the Lehigh Valley.

Washington, D. C.—Attorney-General Gregory recently filed in the Supreme Court the Government's brief in an appeal from the decision of the District Court of eastern Pennsylvania, dismissing the Anthracite Trust suit against the Lehigh Valley R.R. Co., the Lehigh Valley Coal Co., and the Lehigh Valley Coal Sales Co. The action is another step in the Government's attempt to dissolve the alleged anthracite coal monopoly. A sister appeal had already been filed against the Reading company, in which the same charges of monopoly were made. In each case the Government asked that the District Court be reversed, and that the railroad companies be separated from the coal companies.

Portsmouth, Ohio—Announcement has been made by the Whitaker-Glessner Co., that within 30 days work will be begun on a byproduct coke plant which, when completed, will represent an outlay of $2,000,000 and give employment to between 300 and 400 men. This plant will be built by the Whitaker-Glessner Co., and when in operation will have a capacity of 15,000 tons of coke per day. The plant will be a duplicate of the one operated by the Solvay Co., of Ashland, Ky., and will be built by the Semet-Solvay Co., Syracuse, N. Y. The coke output will be employed to operate the new blast furnace near the plant and the two furnaces of the Columbus Iron and Steel Co. If there is a surplus of coke, this will be placed on the market.

St. Louis, Mo.—The Illinois Central R.R. has issued a bulletin urging shippers and consignees not to use cars for storage purposes, but to release them as soon as possible. The bulletin states that the company, in efforts to increase the number of available cars, has in the past five years increased the average miles moved per car per day from 28 to 40, or 43 per cent., which means that 1,325 additional cars have been placed at the disposal of the shipping public per day. The company found that patrons released 25 per cent. of loaded cars within 24 hr. after being placed, 38 per cent. within 48 hr. and 37 per cent. within 72 hr. or more. The company says that if all cars were loaded and released the day placed there would be about 1,000 additional cars available for service on the line per day.

Harrisburg, Penn.—An appeal from the decision of Judge McPherson, in the United States District Court, holding that the Lehigh Valley Railroad Co. violated the Panama Canal Act in maintaining its lake line, was taken recently to the United States Supreme Court. In Judge McPherson's opinion rendered May 12, the court refused to grant a permanent injunction to restrain the Interstate Commerce Commission from enforcing its order requiring the railroad company to give up its interest in the Lehigh Valley Transportation Co., a boat line that operates on the Great Lakes and connects with the railroad company's terminus at Buffalo. A preliminary injunction was granted pending the argument on the application for a permanent injunction. A violation of the law carries with it a fine of $5,000 a day. Rather than risk having to pay such a heavy fine, the Lehigh Valley company was forced to suspend operation of the steamship line.

Columbus, Ohio—The completion of the double-track bridge over the Ohio River between Siloam, Ky., and Sciotoville, Ohio., the latter part of December, will mean that coal from West Virginia and Kentucky mines to Lake ports will be hauled by the Chesapeake & Ohio Northern by way of Columbus instead of Cincinnati. At present these shipments, which average 600 cars a day, arrive in Cincinnati over the Chesapeake & Ohio and depart for Toledo over the Cincinnati, Hamilton and Dayton. When the new bridge is in use the coal trains will connect with the Hocking Valley near Columbus, and will be hauled over that road, which is owned by the Chesapeake & Ohio to the Lake. The change will mean an immense saving to the Chesapeake & Ohio, as the haul by the new route is 96 mi. shorter than by way of Cincinnati and at the same time switching charges at Cincinnati will be saved. The entire run from the mines to the Lake port will be made over the Chesapeake & Ohio's own tracks. The change also will lessen congestion to a certain extent at Cincinnati terminals.

Market Department

GENERAL REVIEW

Heavy demand for anthracite. Bituminous situation hinging on the car supply. Shortage of coal for Lake shipment. Increasing demand in the Middle West.

Anthracite—The market apparently continues very strong but is rather mixed and there are some well-informed observers who take the position that fictitious values are ruling. It seems evident, however, that the tension is certainly increasing while the demand is substantially in excess of production and all present indications point to a tight market throughout the winter. The situation has resolved itself into a question of getting supplies. In this connection there is undoubtedly an abnormal demand from outside points where attempts are being made to accumulate reserve stocks to guard against the possibility of repetition of the acute shortage prevailing last year. On shipments to such points orders restricted to certain specific sizes are liable to be disregarded. The strong demand for bituminous coal continues to exert a stimulating influence on the steam grades. More cold snaps are also creating interest among domestic buyers with a consequent broadening of the demand in this direction.

Bituminous—The bituminous situation now hinges entirely on the car supply. Arrivals at the distributing centers are light, and shippers find it necessary to exercise considerable ingenuity in spreading their limited output over as much ground as possible. Operations are in some instances restricted to two days per week by the short car supply and there is so much complaint of Eastern equipment being held indefinitely in the West, that some of the Eastern lines may shortly declare embargoes against shipments off their own system. The greatest pressure for coal originates from Down East points, and this urgent demand has been largely responsible for forcing up prices. There is so little coal offering in that direction that the market is hardly quotable though we know of sales of small tonnages at abnormally high levels. Supplies at the distributing centers there are at a minimum and there are indications of real distress if conditions are not improved. Receipts at Tidewater have been so light that delays in filling export cargoes have become the rule rather than the exception.

Lake Market—With no indication of any relapse in the record-breaking consumption of the iron and steel industries, as well as general manufacturing lines, and with constantly increasing tension in the car-supply question, the market outlook is constantly growing more acute as the season advances. Consuming interests who have overstayed the market in anticipation of a break are now in a serious predicament. There is very little free coal of any description available, and some of the higher grades are now definitely out of the spot market, while others are quoted at almost prohibitive prices. Some of the large steam users are reduced to a point where they are depending on daily shipments to keep their plants going. The inadequate labor supply is steadily becoming more pronounced, a great many men leaving the mining regions to take employment in the iron and steel and allied industries. Newspaper publicity concerning the situation has only tended to broaden the demand and increase the anxiety of buyers. The Lake loading ports are practically cleaned up and shippers are hard pressed to secure coal to fill out cargoes. The tonnage at the upper Lake ports is hopelessly below requirements.

Middle West—Under the stimulus of an exaggerated newspaper publicity concerning the fuel shortage, buying is even more urgent. Heavy shipments against contracts are absorbing more tonnage as the season advances and more operators are reporting that they have no free coal available. The settlement of the Kansas labor troubles tended to help the situation moderately, particularly as regards screenings, though this may be due in part to the fact that some of the large steam users are drawing on reserve stocks of this grade accumulated in anticipation of the railroad strike some time ago. The colder weather is also becoming a factor in the situation, and is causing a broadening in the demand for domestic grades; retailers' inquiries for tonnage are not bringing much results as a rule. Anticipation of a fuel shortage in the Northwest is evidenced by the fact that the farmers are beginning to cut wood for their winter consumption.

A Year Ago—Cold snap stimulates the anthracite trade. Bituminous stiffer but not particularly active. Further advance in vessel rates checks exports. Car supply becoming the predominating feature at interior points.

BUSINESS OPINIONS

Boston News Bureau—Every day seems to furnish more reasons for optimism. We are gradually readjusting prices to actual conditions. Attention is more and more being called to the enormous corporate earning power, which is beyond all precedent. This is so large that it actually staggers the average man. So long as we continue to export commodities to the amount we are today, so long we shall continue to import gold as well as to absorb foreign-held American securities. There must be some vent for the money which we as a country are making. This is one reason, perhaps, why we see the greatest activity in history, and yet money rates are undisturbed. Stock brokers say that buying for cash is a feature. Naturally excessive prosperity has its burdens. It increases the general desire to share in it. This is focussed today on larger demands on the part of labor.

Iron Age—The first real pinch of car shortage cut down shipments at some Pittsburgh district steel works, in the last week, and here and there more has been heard of labor shortage. Deliveries are not improving, and all indications are that the tension will increase rather than relax. Domestic buying of finished steel for delivery after Jan. 1 is not heavy. Following various sellers' refusals to consider forward contracts a good many consumers are now disposed to take the market as they find it. Now and then surprisingly early deliveries seem to be available, but such cases are only eddies in a generally strong current. There are signs of fresh export buying for everyday rather than war purposes. It is now several months since the last considerable demand of this sort.

American Wool and Cotton Reporter—One fact which stands out in the wool market for the last week is the complete change in the situation. Dealers, after unloading certain supplies are indifferent sellers. Sales for the week have been 7,500,000 lb., principally on fine wools. Some are looking about the market for medium wool in anticipation of the heavy weight season. The movement in wools is strong. It comes from both woolen and worsted mills.

Bradstreet—Propelled by extraordinary expansion in buying power and undismayed by high prices, trade in a collective sense, has risen to very high levels, a veritable ground-swell of new buying having been experienced at leading centers this week. Jobbers, wholesale dealers, retailers and manufacturers all share in the upward movement, and interior merchants, even in zones where the wheat and cotton crops are short, are buying freely, lest there be not enough goods to go around later on. Some cities report record sales by retail dealers, cooler weather, the ending of vacations and the opening of schools elsewhere than at the east having stimulated demand. Visiting buyers throng the larger cities and they, with fall festivals, have imparted exceptional animation to jobbing as well as wholesale trade, especially in dry goods and collateral lines.

Dun—The business expansion, partially checked in some branches and sections during the summer, is resumed with vigor, fresh impetus being imparted to trade and industry as the season advances. The purchasing power throughout the country, notwithstanding the exceptionally high prices, seems to grow rather than diminish, and foreign demands continue extensive, but producing facilities, though extended to the limit, remain inadequate to meet the unprecedented requirements. Commercial failures this week are 289 against 264 last week, 243 the preceding week, and 329 the corresponding week last year.

Dry Goods Economist—Many indications have come to hand this week as to the optimistic attitude of retailers throughout the country. All of the merchants and merchandise men from numerous centers in attendance at the meeting held in New York by the National Retail Dry Goods Association wore an evident air of prosperity. They showed themselves to be impressed with the high prices now ruling for merchandise, but in conversation some of them stated that they had experienced no difficulty in adjusting their own prices to meet these conditions.

Marshall Field & Co.—Current wholesale distribution of dry goods shows large gains over the corresponding week of a year ago. The heavy volume of orders being received on all lines of holiday goods indicates that merchants who are realizing the conditions are getting under cover. Many manufacturers of holiday merchandise are refusing to accept additional orders. Road orders for Spring delivery have been considerably in excess of the same period of 1915. Merchants have visited the market in much larger numbers. Collections for the week have been unusually good. The market on domestic cotton goods, as well as many other lines, is strong and advancing.

Atlantic Seaboard

BOSTON

Hampton Roads grades unchanged. Very little spot coal offering and shipments closely confined to contracts. High prices at this end. Georges Creek shipments extremely light and still farther in arrears. Anthracite shortage making itself felt.

Bituminous—The Pocahontas and New River market continues very strong. The agencies are spreading their curtailed output over as much ground as possible, giving contract obligations the right-of-way. There is so little spot coal offering that it is difficult to say what the market is. Actual sales of small tonnages have been made at $4, f.o.b., though $3.50 is the nominal price, but with no coal available at that figure.

Demand for export is still strong and the bunker trade very active. The shortage of coastwise boats has a discouraging effect on large consumers at this end who try to arrange for cargoes either in excess of contract quotas or to make up for deficient receipts. Some buyers deliberately set out to over-buy and as a result are now getting supplies just about enough to keep them running. A proportion of all-rail coal is helping them out.

The Southern coals have sold up to $6.75 on cars at Mystic Wharf, Boston, and $6.35 on cars, Providence, have been reported. These prices are for delivery a month or six weeks ahead, and in a few instances to Jan. 1.

There is no improvement in the situation of the Georges Creek shippers. The shortage of labor at the mines, lack of cars, together with a diminished fleet of barges has so far reduced receipts of this grade as to make them almost negligible. Distributing wharves are down to a minimum stock and the outlook is distinctly unfavorable. Contractors are most insistent and there are likely soon to be cases of real distress on the part of consumers depending on this grade. Small offerings continue of Georges Creek emanating from smaller operations, but they are usually held for the full spot market price and are less frequent than a week ago.

All of the Pennsylvania districts are beginning to have real difficulties over cars. Some operations have been closed down for three or four days at a time and still others are reported to have only 15 to 20 per cent. of normal supply. At Philadelphia and New York the restrictions against cars for dumping at the piers are seriously curtailing the loadings at those points and conditions promise to be a lot worse.

Bituminous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Clearfields	Camb. & Som's't	Geo'gs. Creek*
Philad'la...	$2.80@3.30	$3.00@3.60	$3.07@3.17
New York..	3.10@3.60	3.30@3.85	3.37@3.47
Baltimore..	.....	.....	3.00@3.10
F.o.b. mines	1.60@2.10	1.75@2.35	2.00@2.10

* On contract.

Pocahontas and New River are quoted at $4@4.25, f.o.b. Norfolk and Newport News, Va. On cars Boston and Providence, the range for the same coals is $6.25@6.50. Sales of larger tonnages for spot delivery at the latter points have been made at $5.75@6.

Anthracite—The short car supply is counting heavily against shipments to Tidewater. In order to keep collieries working the producers are obliged to load every car that offers. When a large proportion of these are either box cars or foreign equipment that cannot be dumped at the loading piers the net result is less coal for coastwise New England. There is delay on practically every barge either at New York or at Philadelphia. Consignees who are at all fussy about the sizes they can take are being generally disappointed. Cargoes have come forward all chestnut or chestnut and pea and schedules calling for any considerable proportion of stove are being passed over.

Independent coal is being offered broadcast, but so much offering is duplicated and so comparatively few retailers are actually buying that it is hard to judge whether there is much really available. The high water freights tend to discourage buying while retail prices are on the present basis.

There are several places in Maine where there is practically no coal on hand. The lack of vessels is proving a very serious matter.

PHILADELPHIA

Heavy demand continues. No remedy in sight for labor shortage. Premium prices to New England. Heavy demand for broken with pea and buckwheat strong. Bituminous takes another jump. Railroad congestion looms up.

The production at the mines continues fair, but so far as can be learned a greater proportion than usual seems to be going to the New England States and Lake points. This fact is pointed out by some dealers to prove that after a few weeks the local market will get sufficient shipments. The outside points suffered such a severe shortage due to railroad embargoes last winter that they are stocking extraordinarily heavy at this time and in some instances actually offering better than circular prices. It is known positively that good consignments of pea coal to these points are being sold for $2.90, or 10c. higher than circular. We also know of some buying between houses where 500 tons of nut coal were taken over from one shipper at an increase of 25c. above circular and then disposed of at a further profit of 20c. a ton.

Probably the greatest activity at this time is among the individual shippers. If anything, they are taking care of their local trade to a lesser degree than the big operators, although this is not always the rule. One of the very largest individual shippers, who was never known to refuse to enter an order, has begun to refuse to take any further orders for stove size.

Many of the local retail men express the opinion that some shippers are endeavoring to create the impression of a scarcity and these dealers state that their greatest difficulty this winter will be to secure competent help to deliver fuel to their customers rather than an actual scarcity of coal. They point out that Philadelphia's proximity to the coal regions, with the short haul and the possible quick return of the empties has proven of benefit during other scares. However, they seem to overlook the fact that the storage yards of the big companies are practically bare now, at a time when they usually reach their maximum.

Broken coal is probably shorter than ever and some of the largest buyers have gone into the open market in order to secure an extra supply. It is known that some of the gas companies are placing orders for egg size, which can be made to do in an emergency. We know of one industrial concern that received a quotation of $4.75 per ton, or 60c. above circular, for 1,500 tons of egg.

Stove coal is not any easier and orders for all good grades are hopelessly in arrears. Chestnut the slowest of the prepared sizes to respond is undoubtedly gaining strength. Egg is not particularly short locally; that is, the dealers are selling very little of it. The cold weather will bring business on this size, but just now they report having filled almost all of their orders for it; however, the price is strongly maintained by all shippers. Pea coal occupies the place predicted for it some weeks ago. Orders and requests for prompt shipment are too numerous to receive good attention and price cutting is unheard of.

In the steam grades, buckwheat continues to be the leader and with the steady advance of bituminous coal individual shippers are asking all the way from $1.70 to $1.90 on shipments of one to two carload lots. While the other steam sizes are fairly active the demand does not seem to be unusual as yet, although it is known that the larger companies have a very small tonnage in storage.

Collections have improved and will continue good. The shippers are very frank with their trade and tell them plainly they cannot expect attention while their accounts are overdue; the dealer who pays his bills promptly is being the best supplied with family coal now and we believe these conditions will exist for the balance of the year.

The prices per gross ton, f.o.b. cars at mines, for line shipment, and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buck	$1.65	$2.55
Egg	4.15	5.25	Rice	1.00	1.90
Stove	4.40	5.60	Boiler	.90	1.80
Nut	4.50	5.55	Barley	.75	1.65
Pea	2.80	3.70			

Bituminous—There is no check to the upward trend of prices and the $2 point has been well passed; the only grades under that figure are some of the Fairmont coals and there is not the least doubt that in a short time there will be no offerings at all under $2. While the local demand is exceptionally strong, the greatest pressure seems to be coming from New England and that is actually the cause of the high prices here. It looks as though that territory after being badly caught by railroad embargoes last winter, is making unusual efforts now to accumulate stocks and thus prevent a repetition of that experience. Several big consumers from there have sent their own buyers into the mining fields, but this instead of helping the situation only has a tendency to increase prices, as they are practically bidding against themselves in competition with the same brokers who are trying to fill their orders.

As is to be expected under these conditions there is the greatest activity here at the piers, with a big tonnage moving to all coast points. Most shippers claim that they are only receiving a 50 per cent. car supply at the mines, which is far from enough to take care of their production even with a curtailed labor supply. It is the general belief that the rail movement will be even more restricted than last winter, which was one of the worst in the experience of the trade. There is quite a little inferior coal coming into the market at this time, which always comes to the front when the demand for fuel becomes extra urgent, and the high prices ruling on this coal is a true indication of the trend of the situation.

We list below prices per gross ton on the better grades usually traded in here which represent a fair estimate for the time being, although changes are of daily occurrence.

Georges Creek Big Vein	$2.35@2.50
South Fork Miller Vein	2.25@2.35
Clearfield (ordinary)	2.20@2.30
Somerset (ordinary)	2.20@2.30
West Va. Freeport	2.15@2.25
Fairmont gas	1.90@2.00
Fairmont gas, mine-run	1.75@1.85
Fairmont gas, slack	1.80@1.85
Fairmont lump, ordinary	1.85@1.95
Fairmont mine-run	1.75@1.85
Fairmont slack	1.75@1.85

NEW YORK

Anthracite tension is increasing. All domestic grades bringing premiums and steam coals in good demand. Brisk call for bituminous and prices strong. Mine quotations higher than at Tidewater.

Anthracite—Many wholesale dealers are refusing orders for anthracite. The tension has increased more rapidly than is usual for this time of the year and producers are finding themselves far behind on their orders. Consumers are buying heavily and retailers are crowded to keep sufficient stocks on hand. Production is not up to the demand and hopes of breaking production records this year have been abandoned. It is apparent that there is going to be a tight market throughout the winter.

The companies are taking care of their regular trade but new buyers stand very little chance of having their orders booked. Good premiums are being received for Tidewater coal but better figures are obtained for line shipments. Line trade is brisk and salesmen report an urgent demand.

Stove coal remains the shortest of domestic grades at Tidewater, and some dealers report quotations of from 50 to 75c. above company circular. Mine quotations of $5 are heard.

There is a heavy demand for egg coal and individuals are quoting 50c. above regular schedule.

Chestnut is gaining strength and individuals are receiving from 10 to 25c. above the regular winter price.

Pea is commanding full circular and an occasional cargo is reported higher. The better grades are scarce at Tidewater.

There is a strong demand for the steam coals, which will continue to gain strength now that the heat has been turned on in the big office buildings and factories. All sizes are scarce and only the cheaper grades can be obtained, if at all. Buckwheat No. 1 is being quoted at from $2.35 to $2.50 at the mines for line trade, which, based on the Tidewater prices, shows an advance of from 90c. to $1.05. Demand for buckwheat Nos. 2 and 3 remains firm.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports, are as follows:

	Circular	Individual
Broken	$4.95	
Egg	5.45	$5.45@5.95
Stove	5.70	5.70@6.20
Nut	5.75	5.75@6.00
Pea	4.00	4.00@4.25
Buck	2.75	2.75@3.00
Rice	2.20	2.10@2.20
Barley	1.95	1.85@1.95
Boiler	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The bituminous situation shows increasing strength, although Tidewater dealers say there has been no great rush for supplies. Buying, however, is heavy at the mines and there are many representatives of large consumers in the coal fields. Western demand is heavy and good prices are offered for contracts. While there has been a stiffening in mine quotations, prices for Tidewater deliveries have also taken a boost. Contract coals are holding their own, but occasionally shippers are found raking the market for enough to fill out a boat-load.

Car supply shows no improvement and if anything is getting worse. Some producers are not able to average more than two days a week while few are working their mines more than half time. Some operators report a slight improvement in the labor situation, owing to the return of mine workers from the farms.

Supplies in New England show an improvement, but there is considerable empty space and most dealers are anxious to fill up before transportation difficulties must be met. Water shipments from New York are heavy, notwithstanding high rates.

Locally, very little free coal is available and quotations for the cheapest grades range from $3.50 to $3.65. Fair grades were quoted around $3.75 and the better grades from $3.90 to $3.95. Instead of mine quotations ranging from $1.90 to $2.25, sellers are naming $2.50.

Bunkering coals are in heavy demand.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades, follow:

	Port Reading	St. George	Mine Price
George Crk.			
Big Vein	$3.60@3.80	$3.60@3.80	$2.05@2.25
Tyson	3.30@3.50	3.30@3.50	1.75@1.95
Clearfield	3.25@3.60	3.25@3.60	1.70@2.05
South Frk	3.40@3.55	3.40@3.55	1.85@2.00
Nanty Glo	3.45@3.50	3.45@3.50	1.90@2.00
Som'r. Co.	3.45@3.60	3.45@3.60	1.90@2.05
Que'ho'ing	3.30@3.40	3.30@3.40	1.75@1.85
W. V. Fa'rm't			
Th'r'qua	3.60@3.80	3.60@3.80	1.80@2.00
Mine-run	3.50@3.70	3.50@3.70	1.70@1.90
West. Md	3.00@3.20	3.00@3.20	1.45@1.65

BALTIMORE

Prices keep moving upward with a strong trend. Car shortage and inability to get coal to tide the dominating factors.

Bituminous—The entire price trend of the market is upward. The car scarcity has grown acute in many coal regions. The Baltimore & Ohio alone reports more than 20,000 cars on foreign lines. Despite every effort toward prompt recovery of rolling stock, the situation has steadily grown more tense and there is little hope for relief as the Western roads are holding the fuel cars for their own use. The Baltimore and Ohio and Western Maryland may both find it necessary to place embargoes against fuel shipments off their own lines. The strength of the market is not due entirely to the unusual demand for fuel. There is barely enough delivery at tide to meet export, bunker and local requirements and the mines have constantly stiffened quotations for quick shipments.

Prices to the trade at the mines are as follows: Georges Creek, Tyson, $2.35; Somerset, $2.25; South Fork, $2.35; Clearfield, $2.25; Quemahoning, $2.35; Latrobe, $1.85; Freeport, $2; Fairmont gas, ¾, $1.80; mine-run, $1.70, slack, $1.65.

Anthracite—Small sizes are still scarce. Slow rail movement is having its effect on supplies, and late delivery on summer order business has been delayed in many instances. There has been no heavy fall ordering for quick delivery, however. The entire trade is expecting a very brisk October, if supplies can be secured as desired.

Exports—The export movement the past week dropped off a little from the heavy previous seven-day period. The total moved for foreign account was 14,214 tons. Italy and Spain took most of this tonnage.

HAMPTON ROADS

Shipments light due to shortage of coal. Vessels delayed. Foreign freight rates advancing. Prices firm.

Receipts via the three coal roads are still distressingly light. Demand is far in excess of supply and all shippers are short on their obligations. There is no shortage of bottoms, but shipments are necessarily below normal on account of the difficulty in getting coal to Tidewater. Practically all cargo vessels are meeting with delay, some of them having to shift to the different terminals to complete loading. Several of the German steamers, which have been here since the war started, are taking small supplies, to move to another port.

Under the present conditions there is naturally very little free coal available. Where any shipper has a few tons surplus he is able to dispose of it at very good prices. Some agencies have been so unfortunate as to have to purchase a small tonnage at market prices to fill out on contract business. The first shipment on account of the new Panama contract will be made shortly.

The large and well-known ocean tug "Paul Jones," familiar in the coastwise coal trade for years, is reported to have been sold to the British Government. The coastwise tug "Scranton" is also reported to have been sold to the same interests. It is understood that other tugs are wanted but the owners are unwilling to sell without disposing of the barges at the same time.

The low level in foreign freight rates seems to have been reached last week. Inquiries are more frequent now and rates show a slight advance. None of the shippers will quote prices for future delivery, and there is considerable interest as to just how high prices will go.

At presnt the ruling quotations are as follows: Pocahontas and New River, for cargo, $4@4.50 per gross ton, for bunker delivery, $4.50@4.75 per gross ton, plus 10c. per ton trimming, on tracks for local consumption, $4@4.25 per net ton. Anthracite still remains at the summer circular of $7.50 per net ton, delivered. High volatile follows the smokeless market, good prices being received for this grade.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the weeks ended Sept. 23, 1915-16, and for the first 13 weeks of the last half of the years:

	Week		13 Weeks	
	1915	1916	1915	1916
Nor. & West...	163,400	146,339	2,377,589	2,114,192
Ches. & Ohio..	91,341	57,283	1,239,917	1,230,976
Virginian.....	79,176	67,428	889,150	1,109,904
Total.....	333,917	271,050	4,506,656	4,455,072

PANAMA CANAL

Fuel movement through the canal for the two weeks ended Sept. 9 was as follows:

Vessel	From	To	Tons
Spilsby	Cardiff	Esquimalt	5,400
Alaskan	Newport News	Valparaiso	1,102
Hesperos	Newport News	Callao	5,492
Birkhall*	Baltimore	Antofagasta	.....
Lewisham	Norfolk	Pisaqua	3,869

* Coal and coke.

As a result of the scarcity of coal the following statement has been issued by the Government regulating bunkering:

1. Difficulties experienced in securing the delivery of sufficient coal to supply ships using the Canal with all the bunker coal they desire make it necessary to request the co-operation of steamship lines in limiting the amount of coal required by their ships to a minimum.

2. For the present, it is requested that vessels be dispatched so that those passing from the Atlantic to the Pacific will require only sufficient bunker coal to reach San Francisco, Honolulu, or Coronel. Those vessels trading to South American ports north of Valparaiso will be supplied with sufficient coal for return voyage to the Canal. In the case of vessels passing from the Pacific to the Atlantic and bound for European ports, it will be impracticable at present to supply them with sufficient bunker coal to make the voyage direct, but they will be bunkered to reach Norfolk or Newport News, Virginia.

3. Those vessels using either terminal port as a terminus of their established route should be dispatched so as to require only sufficient coal to make the next port of call on their established route where a commercial coaling station is available.

4. It is hoped that deliveries will in a short time make it unecessary to longer restrict the amount of bunker coal for vessels using the Canal.

Coal is supplied to vessels at both Cristobal and Balboa. Present prices are: At Cristobal, from lighters, trimmed in bunkers, or from cars alongside wharf, handled by ships' gear, per ton, $6; use of steam hoist and crane per hour, $2; at Balboa, the price is $1 more per ton, either form of delivery. Prices will be advanced to $7.50 per ton at Cristobal and $9 at Balboa, effective Oct. 1, 1916.

Ocean Shipping

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
Henry Tegner	Guantanamo	865	
Berlin	Puerto Padre	2,800	
Wm. C. May	Marin Bay	607	
William Cobb	Nova Scotia	356	
Prydwen	Manzanilla	295	$6.00
Laura C. Anderson	St. L. du Rhone	1,600	15.00
Mona T.	Gibara	475	
M. R. Bohannon	Windsor, N. S.		3.50

BALTIMORE

Claverack	Felton	2,441	
E. H. Cole	Barcelona	[1]1,395	28.00
Mary W. Bowen	Marseilles	1,907	
Eagle Wing	Marseilles	[1]1,076	28.00
Clara A. Donnell	Marseilles	[1]990	28.00

VIRGINIA

Baron Fairlie	Buenos Aires[2]	2,323	$14.40
Argo	Havana	1,488	3.25
	St. Georges, Bermuda		4.25

[1] Coke. [2] Or La Plata.

OCEAN FREIGHTS

During the past week the steamer market was very quiet and very few charters were effected for export coal; the most important is the reported fixture of a September steamer for Rio at $12.50 per ton, net terms. On account of the scarcity of freights we consider the general freight market easier, with the exception of freights to the Windward Islands.

We would quote freight rates on coal by steamer as follows:

	Sept. 18	Sept. 25
West Coast Italy....	$27.60@30.00	$27.60@28.80
Marseille.....	25.20@26.40	25.20@26.40
Barcelona*[2].....	22.80@25.20	22.80@25.20
Montevideo.....	14.40 about	13.20 about
Buenos Aires.....	14.40 about	13.20 about
Rosario.....	15.60 about	14.40 about
Rio Janeiro.....	12.25 about	12.00 about
Santos.....	12.75 about	12.50 about
Chile (good port)....	9.00@10.00	9.00@10.00
Havana.....	4.00 about	3.75@4.00
Cardenas, Sagua....	5.00 about	5.00 about
Cienfuegos.....	4.50@5.00	4.50@5.00
Port au Spain.....	6.66 about	6.00@6.50
St. Lucia.....	6.60 about	6.00@6.50
St. Thomas.....	5.50 about	5.75 about
Barbados.....	6.00 about	6.00@6.50
Kingston.....	4.50@5.00	4.50 about
Curacao[1].....	5.25 about	5.75 about
Santiago.....	4.50@5.00	4.50 about
Guantanamo.....	4.56@5.00	4.50@5.00
Bermuda.....	4.00 about	4.50 about
Vera Cruz.....	5.50@6.00	5.50@6.00
Tampico.....	5.50@6.00	5.50@6.00

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port.
W. W. Battie & Co.'s Coal Trade Freight Report.

VESSEL CLEARANCES

The following vesels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Dictator[7]	Puerto Cabello, Venezuela	999
Tirreno[1]	Bagnoli, Italy	4,493
Oldfield Grange[4]	Havana, Cuba	7,573
Oceano[1]	Genoa, Italy	3,773
Ella M. Willey[8]	Ponta Delgada, Azores	925
Nordland[3]	Kingston, Jamaica	1,964
Achilles[6]	Cristobal, C. Z.	12,011
Clare[1]	Guayaquil, Ecuador	1,977
Swindon[1]	Genoa, Italy	3,936
Posillipo[1]	Porto Ferrajo, Italy	7,292
Winlaton[2]	Buenos Aires, A. R.	4,206
Berwind[4]	San Juan, Porto Rico	2,950
Bartolo[8]	Mejillones, Chile	4,251
Aristoteles C. Ioannou[9]	La Plata, A. R.	3,766
Baron Fairlie[9]	Buenos Aires, A. R.	5,480

NEWPORT NEWS

Ilford[9]	Iquique, Chile	6,000
Maumee[10]	Montevideo, Uruguay	3,446
Suffolk[2]	Rio de Janeiro, Brazil	6,437
Siam[2]	Bahia, Brazil	2,602
Banan[2]	Santiago, Cuba	1,264
Theoline[9]	Yabucoa, Porto Rico	1,379
Nolisement[11]	Dakar, F.W.A.	7,650

PHILADELPHIA

Berlin	Puerto Padre	2,800
Josey	Havana	
Orkild	Havana	
Lodaner	Havana	2,106
Santurce[2]	Guayanilla, P. R.	
Moldegaard	Antilla	
Henry Tegner	Guantanamo	865
A. E. Bullard	San Juan, P. R.	1,223

BALTIMORE

Renfield	Brazil	982
Eagle Wing	France	1,845
Ascensione	Italy	2,688
Fenice	Italy	2,170
Urkiola Mendi	Spain	4,800
Lynorta	Peru	1,729

[1] Pocahontas Fuel Co. [2] Berwind-White Co.
[3] Castner Curran & Bullit. [4] Baker-Whiteley Co.
[6] Smokeless Fuel Co. [6] W. C. Atwater & Co.
[7] Dexter & Carpenter, Inc. [8] Northern Coal Co.
[9] C. & O. Coal & Coke Co. [10] Maryland Coal & Coke Co. [11] C. H. Sprague & Son.

COASTWISE FREIGHTS

Rates on large vessels from Hampton Roads to Boston continue strong at $2, with no sign of movement either up or down. It is difficult to get shippers to promise loading and accordingly the demand cannot be said to exceed the supply. Only a very few boats return from off-shore business and those only for a trip or two.

A few charters are being made from New York to Boston on independent anthracite, rates averaging about $1.75; $1.25@1.30 is being paid to Providence and New Bedford, New York loading, the bulk of this tonnage being engaged in anthracite.

Lake Markets

PITTSBURGH

Car shortages pronounced, with slight labor shortage. Demand excellent in all quarters. Prices well maintained.

There is still more complaint as to car shortages and there is scarcely a mine that does not lose in output two or three days in the week on this account. Allotments are frequently only on a 50% basis. There is some shortage of labor but this is not as pronounced as it would be if there were cars to move all the coal that would otherwise be produced. Lake shipments are falling decidedly behind the requirements and predictions are made in many quarters that there will be considerable all-rail movement to the Northwest this winter.

The line demand is very good. Iron and steel works are taking maximum tonnages under their contracts, their consumption being practically at record rate and there is no sign of any reduction in their rate of operation for many months.

Car supplies Monday were a trifle better than at the close of last week but on Tuesday the shortages were more pronounced than ever and shippers are having great difficulty in making their contract shipments while they have very little free coal to offer in the daily market. In the past few days there has been a much more insistent demand from the East and as high as $2.50 per gross ton has been bid for Clearfield County coal for shipment East if the seller could furnish car numbers. On account of the difference in freights East this would be equivalent to $2 f.o.b. Pittsburgh district mine or $1.80 per net ton. It is reported that 25c. less was bid for Clearfield coal for shipment over three or four months. Regular buyers in the Pittsburgh district are not offering equivalent high prices but are paying 10 or 15c. more for spot coal than a week ago.

Occasionally inquiry comes for high-grade coal that cannot be met at any figure as operators have little coal to spare. We continue to quote: Slack, $1.20@1.40; mine-run, 1.65@1.75; ¾-in., 1.75@1.85; 1¼-in., 1.85@1.95, per net ton at mine, Pittsburgh district. The circular price of $1.50 for mine-run is of course nominal. There is scarcely any inquiry as to contract and no definite market is developed.

BUFFALO

Growing scarcity of all coal. Bituminous asking prices advance. Premium on independent anthracite. Buffalo prices lower than outside. Mining slow.

Bituminous—There is a growing scarcity of everything but mine-run from all sources. Jobbers are casting about for supplies, but operators state that it is useless to make promises, for they could not be kept. Buffalo consumers are not in sufficient need of coal to create any flurry, for they have so many sources to draw from that they will not pay the advance prices asked. It is calculated by jobbers that the price paid by local consumers is from 25 to 50c. lower than the corresponding price eastward. This is largely because certain coals have no regular freight rate east of here.

From all the mines there is a uniform report that the miners are working very unsteadily and that it is impossible to increase their number materially. They go from one mine to another and are as likely to find their way into the steel mills as anywhere. In some instances the strikes of the former part of the season are on and if the mines are worked it is under protection of the sheriff. If the consumption increases materially there is danger of a famine this winter.

Quotations remain strong at former figures made by leading Pittsburgh operators for this market, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump.....	$2.95	$2.75	$3.00
Three-quarter.....	2.85	2.60	
Mine run.....	2.75	2.50	2.80
Slack.....	2.40	2.30	2.80

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—The demand is increasing fast. The rail-line movement has been active some weeks and now the local consumers are waking up. There is no clamor for coal yet, but that will appear as soon as the weather is at all severe. Shipping agents are getting orders from outside, which come from new sources. They know them to be from retailers who have been unable to get sufficient supplies from regular sources. This indicates a general shortage before long.

An independent anthracite shipper this week asked $1 premium for coal to a new customer. While such a demand is excessive now, it shows what is to come when winter sets in. Nobody doubts that the premium will be $1 and it is predicted that it will be much higher than that. The regular premium is about 25c.

Lake shipments of anthracite are light, on account of scarcity of coal and lack of tonnage. The amount loaded for the week was 65,000 tons, of which 22,700 tons cleared for Milwaukee, 16,400 tons for Duluth and Superior, 14,500 tons for Fort William, 8,150 tons for Chicago and 3,250 tons for Port Arthur.

Lake freights are advancing. Slow docks on Lake Michigan pay $1 and fast ones 85c. per per ton. Regular Lake Superior rates are 30c. to fast docks. Some recent cargoes have paid 50c. to fast docks.

The Buffalo anthracite circular is as follows per gross ton, f.o.b. cars:

Grate.....	$5.85	Chestnut.....	$6.35
Stove.....	6.10	Buckwheat.....	3.50
Egg.....	6.10	Pea.....	5.00

A charge of 25c. additional is made for loading on Lake vessels.

TORONTO, CAN.

Anthracite in active demand. Bituminous getting scarce. Deliveries much delayed by car shortage and stocks diminishing.

With the setting in of decidedly cool weather there is an increasingly active demand especially for anthracite, and dealers have been busy. Stocks have been diminishing, as but little coal has been coming forward and deliveries by rail are greatly delayed on account of car shortage. It is expected that conditions in this respect may improve with the close of navigation when cars should be more plentiful. Bituminous is getting scarce, especially slack which shows an upward tendency.

Quotations for best grades per short ton are as follows: Retail, anthracite, egg stove and nut, $8.50; grate, $8.25; pea, $7.50; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, $4.35; screenings, $3.50; Pennsylvania smokeless lump, $4.25; slack, $3.60; Pocahontas lump, $5.75; slack, $4.30.

DETROIT

Buying of steam coal continues in good volume. Gradual improvement in the domestic market. Lake trade is restricted by car shortage.

Bituminous—Just about enough steam coal is coming into Detroit to meet current needs of the consumers. The coal users are beginning to show a greater interest in prices and prospects for immediate and future delivery. There is no important increase in volume of business, but the jobbers and wholesalers say they probably could sell more coal if they were able to get it. There is some coal arriving from the flooded part of West Virginia but the shipments are not large enough to have much affect on the market. Nut, pea and slack of either Ohio or West Virginia origin is obtainable at about $2.80. Mine-run from West Virginia is about $2.90 and from Hocking mines $2.55, while three-quarter lump ranges from $2.80 for Hocking to $3.15 for West Virginia stock.

Buying is somewhat improved in the domestic trade, because of continued low temperature. Retail dealers have not come into the market very actively, though some have found that prices have been advanced.

Anthracite—There is a slightly increased demand for anthracite also and retail dealers have a considerable portion of their equipment busy delivering coal to householders. Not very much anthracite seems to be coming to Detroit and stove size is not always easily obtained. In some towns of Michigan outside Detroit, buyers are reported paying a premium as high as 65c. on stove size.

Lake Trade—Deficient car supply has made a considerable reduction in the shipments of coal arriving at Lake ports. Rather than wait for enough coal to fill out cargoes, some vessels, which have season contracts are being sent to the upper end of the route without cargo. On charters closed during the week 70 and 75c. was paid for delivery of small cargoes at leading ports on Lake Michigan. Shippers are making tentative offers of coal to be moved next season, on the basis of whatever may be the going rate. Vesselmen show no haste to accept and are holding off, also on carrying contracts covering a period of years which are offered on the basis of the going rate each year being made the freight charge under the contract.

CLEVELAND

Labor troubles and increased car shortage holding prices firm. Practically all Lake coal cleaned up. No quotations made on most grades for spot shipments.

Labor troubles at several of the mines and the increased car shortage have kept prices firm in this market on all grades of coarse coal and has increased the price of slack. Most large Cleveland plants use slack and it has been impossible to get enough of this grade to take care of contracts without paying a premium for same, notwithstanding the fact that a great many of the operators are screening their railroad fuel in order to increase their slack tonnage.

Practically all Lake coal at Lake Erie ports has been cleared up and Lake shippers are hard pressed to secure enough coal for cargoes, which has forced several vessels to go up light.

It is impossible to get quotations on Youghiogheny, Pittsburgh, Hocking, Fairmont or Pocahontas for spot shipment as operators in these fields are all sold up for some time to come. These conditions are bound to force up the prices on Pittsburgh Number Eight and Middle district coals coming to this market and there is no way of telling how high the prices will go. The highest price heard of, was $1.60 f.o.b. mine for 10,000 tons No. 8 mine-run.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$2.30	$2.20	$2.20
Cambridge	2.30	2.20	2.20
Middle Dist.	2.20	2.10	2.10
Hocking	No quotations made		
Youghiogheny	No quotations made		
Pittsburgh	No quotations made		
Pocahontas	....	3.50	....
Fairmont	2.75	2.65	....

COLUMBUS

Demand increasing daily, car shortage growing worse, and the market active. Prices are ruling higher in every locality.

Steam users, dealers and dock men are demanding coal, which operators and jobbers are unable to deliver. The car shortage is curtailing production to a low point in the face of the strong demand. It is a runaway market in every detail and prospects for the future are for still greater demand and higher prices.

The circular figures announced several weeks ago are not adhered to, as any one with free tonnage can name their own price. As a result premiums are the rule. Dealers are clamoring for shipments as their stocks are low and the ret" business active. Dealers are no longer particular as to the kind of equipment and are as anxious for "hoppers" as other style of cars.

The steam trade is still good and all plants are working on full time. As a result, their fuel requisitions are high and every effort to accumulate stocks has met with failure. Most large consumers are working from hand to mouth. Prices of steam grades on the open market are almost prohibitive for stocking purposes. Railroads are taking a large tonnage for the movement of trains.

Lake trade is still active, although a considerable tonnage is being diverted into steam channels. The Northwest is still clamoring for coal and shippers are rushing as large a tonnage as possible to the head of the Lakes. A falling off in tonnage is reported by the Toledo docks of the Hocking Valley Ry., which loaded 100,000 tons during the week ending Sept. 22. Boats are hard to charter and rates on "wild bottoms" are almost prohibitive.

The car shortage has curtailed production in every mining district of the state. The Hocking Valley Ry. is probably in best shape and little shortage is reported on that line. The T. & O. C., the K. & M. and other roads are very short of equipment and production is in some instances below the 50 per cent. mark.

Prices on short tons, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$2.20	$2.30	....
Inch and a quarter	2.00	2.10	$1.90
Three-quarter inch	1.75	1.85	1.70
Nut	1.50	1.60	1.45
Egg	1.50	1.50	....
Mine run	1.50	1.50	1.45
Nut, pea and slack	1.20	1.25	1.15
Coarse slack	1.10	1.15	1.05

CINCINNATI

Increasing strength is evident in the market, the advancing season and continued car and labor shortage being the principal factors. Higher prices are anticipated.

Increased retail prices for all grades of coal were taken as indicating that retailers have become convinced that they are not going to be able to stock up with cheap coal this season. Many of them have overstayed the market and have found it necessary to bid for coal, which is in marked contrast to the situation for the past two years. There is a real scarcity of coal, as compared with the normal demand, and limited supplies of labor, coupled with a continued car shortage, are handicapping the production.

There is, of course, no danger of an actual shortage here, with the river, West Virginia and eastern Kentucky to draw upon, but the heavy demand and relatively limited supply are certainly strong market factors, with the season of heaviest consumption just ahead. The surplus in the hands of dealers in the Northwest has now been exhausted, and the demand from that section is much heavier than it has been.

LOUISVILLE

Car shortage worse in Kentucky fields; buyers find themselves unable to place orders. Increased prices predicted.

The worst situation in fifteen or twenty years is the way Kentucky operators describe the situation as to the car shortage. A two-day a week car supply has developed and as a result miners in some fields are seeking employment in other work. A Louisville industrial concern is reported to have canvassed the eastern Kentucky fields with an order for six cars of mine-run (300 tons) without finding a seller and his order was also promptly declined by all western Kentucky concerns. Reports of the condition are getting into the newspapers and as a result domestic consumers are placing rush orders with retail dealers. As a rule the retail prices have not advanced, in competitive markets, although a price of $5 a ton is predicted for mid-winter in central Kentucky.

Quotations show little apparent change, but operators state that they could command virtually any price if they were able to make deliveries. Eastern Kentucky operators quote f.o.b. mines, long ton basis, approximately: Block, $2.50; lump, $2.25; round, $1.75; mine-run, $1, with no nut and slack priced. The western Kentucky lump quotation is $1.30 or $1.50, according to competitive conditions. There is no steam coal on the open market.

BIRMINGHAM

Market strong on all grades. Car supply limited and controls production and movement. Prices advance.

Operators are being swamped with orders for both steam and domestic coal, with liberal premiums offered by spot buyers, but the supply limits the bookings very materially. Bunker coal is showing increased activity and there are no accumulations at any of the gulf ports. Several large companies have withdrawn all quotations. Domestic mines can accept only limited business for October and present indications are they will be entirely out of the market in ten days or two weeks. We quote below on steam and domestic grades, f.o.b. mines:

Pratt mine-run	$1.40
Black Creek mine-run	1.40@1.50
Carbon Hill mine-run	1.25
Big Seam mine-run	1.10
Big Seam mine-run, washed	1.25
Cahaba mine-run, washed	1.50

	Lump	Egg
Montevallo	$3.25	$3.00
Cahaba	3.00	2.75
Black Creek	3.00	2.75
Carbon Hill	2.00	2.00

Production and movement of coal is handicapped by a 50 per cent. car supply, and the large emigration of laborers and miners from the district is also being felt at the operations.

Coke

CONNELLSVILLE

Interest appearing in furnace coke for first half 1917. Prices stronger all around and up fully 25c. Production and shipments slightly increased.

Several furnace interests have begun sounding the market on coke for the first half of the new year. They have been led to take an interest in the matter thus early as they have disposed of large tonnage of pig iron for the period and have received intimations that operators are going to demand higher prices for first half than had been expected. One contract for first half has already been closed the price being $3, but this was for an exceptionally good grade. There are three formal enquiries in the market for first half totalling fully 40,000 tons a month. Operators now expect additional sales to be put through at about $3, but rather look for still higher prices after the more eager sellers have disposed of their coke.

The spot furnace coke market has started to jump and there have been several sales at $3.25. There does not seem to be any spot coke offered at less and there remains some unsatisfied inquiry from consuming interests.

The sudden further stiffening in the coke market is attributed chiefly to the higher prices obtainable by coal supplies being restricted on account of the car shortage. It is now claimed that additional byproduct coking capacity if it really comes in will not tend to depress the coke market as it will mean so much more demand for coal. Foundry coke has stiffened in harmony with furnace coke and we now quote spot furnace $3.25, contract $3, spot foundry $3.50@3.75, contract $3.50@3.75.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 16 at 393,447 tons, an increase of 9,073 tons, and shipments at 396,307 tons, an increase of 12,094 tons.

Buffalo—Shippers are advancing prices on all but the regular furnace grade, on account of the good demand and the scarcity of cars and miners. Quotations are: $5.85 for best Connellsville 72-hr. foundry, $5.10 for 48-hr. furnace, $4.85 for high sulphur and $4.75 for stock coke.

Chicago—Coke sales are few and far between because the producing companies are restricting their output to contracts when cars are available. A few shipments of spot coke have been sold at premium prices. Nominal quotations per net ton f.o.b. cars Chicago, are as follows: Connellsville, $6@6.25; Wise County, $6@6.25; byproduct foundry, $6@6.25; byproduct domestic, $5@5.50; gas house, $4.75@4.85.

Middle Western

GENERAL REVIEW

Prices reach still higher levels. Screenings slightly easier. Anthracite tight. Smokeless selling at premium prices.

Country and city retailers have been heavy buyers during the past week. With a shortage of cars and labor the upward tendency of prices is easy to understand. Frequent complaints are made that coal is moving very slowly from the mines en route to destination. The daily press has been giving considerable publicity lately to advancing prices of retail coal, particularly mentioning the higher figures quoted for anthracite sizes and considerable erroneous information has been spread broadcast as to market conditions and prices.

Screenings have shown an average decline of 5c. per ton, due in part to settlement of the labor troubles in the Kansas field, which permitted the mines there to supply local needs and created a surplus of Central Illinois screenings, which had to be placed. In addition to this, industrial plants are working off surplus screenings purchased during the first part of the month, owing to the strike scare, and this has reduced their normal buying somewhat. The larger sizes of steam coal have lost none of their strength. The recent advance to $2 for the major steam sizes from southern Illinois is steadily maintained, with every possibility of higher figures being quoted shortly.

Car supply has been woefully lacking at Indiana and Illinois mines. Some mines in the Indiana field have only operated four days during the week, and the Harrisburg district has been badly hit, obtaining but 50 per cent. running time. The demand for domestic coal continues to increase, and most of the mines are sold up ahead for several weeks. Many operators are now afraid to accept orders for future delivery on account of car shortages and soaring prices. Quite a little Southern steam sizes are coming into Northern territory, being sold at what are considered advantageous prices compared with schedules on Northern steam coals

The shortage of coal at Lake Superior docks at the end of August was estimated to be nearly 3,000,000 tons, compared with the shipments to the same date last year. Coal is going off the docks must faster than it is being received, and Northwestern farmers are now cutting wood for winter consumption, anticipating a famine of coal this season. It is probably true that soft coal has advanced to such new high figures in the Northwest that farmers find it cheaper to cut their lumber for fuel purposes than to use coal.

An increasing number of operators report that they have no coal to offer, and most of them would be glad to obtain free tonnage to market under present selling conditions. Very few salesmen are on the road to obtain orders; a good many of them are spending their time in and around the mines, helping to obtain cars and performing other duties not in their regular line of work.

CHICAGO

Prices in Chicago very strong except for screenings, which are slightly easier. Smokeless coal reaches new speculative prices. Anthracite uncertain with slow deliveries and higher prices predicted.

Franklin County production is well sold ahead. Although $2 is the asking price for lump, egg and No. 1 nut, southern Illinois producers could easily secure $2.25 for the major sizes. A further advance on all grades will no doubt be put into effect on Oct. 1. Williamson County lump is off the market; nut and egg are easier, but even these grades are sold ten days ahead of production. Southern Illinois mines at the present time are running about 80% of capacity. Mine-run is being firmly held at $1.35, and screenings from the southern Illinois mines have averaged $1 this week.

Smokeless mine-run is strong at $1.75 to $2, and some prepared sizes have reached $2.50. Chicago retailers have been sending out inquiries during the week but secured little tonnage. Some wholesalers are declining to take any new business at the nominal figures at $1.75 for mine-run, and some of the country dealers have been paying as high as 25c. per ton premium for immediate shipment. Pennsylvania smokeless is reaching here in very small quantities without any trouble in effecting disposition at new high levels.

Indiana quotations are extremely firm. Knox County operators are almost entirely out of the open market and are making heavy shipments against contracts. A steadily increasing inquiry for Clinton sizes is noted. The recent frosty weather has had its effect on retail business, and Indiana retailers have made insistent calls for tonnage this week. No. 4 Clinton lump is nominally quoted at $2 but premiums are easily obtained for immediate shipment. Sullivan and Linton No. 6 coals have shown much activity recently.

Quotations in the Chicago market are as follows:

	Wilms. and Frank. Cos.	Springfield	Linton and Sullivan Co.	Clinton	Green and Knox Cos.
Lump	$2.00	$2.00	$1.85@1.90	$1.90@2.00	$1.90@2.00
Steam lump	1.50@1.65	1.50@1.60	1.40@1.50	1.35@1.50	1.40@1.50
2½ and 3-in. lump	....	.....	1.75@1.80	.....	.....
1¼-in. lump	.....	.....	1.40@1.50	.....	.....
Egg	2.00	1.90@2.00	1.60@1.75	1.75@1.80	1.80@1.90
Nut	2.00	1.75@1.90	1.35@1.50	1.50@1.65	1.60@1.65
No. 1 washed	2.00	.....	.....	.....	.....
No. 2 washed	1.75@1.85	.....	.....	.....	.....
No. 1 nut	2.00	.....	.....	.....	.....
No. 2 nut	1.75@1.85	.....	.....	.....	.....
Mine-run	1.25@1.35	1.25@1.35	1.25@1.35	1.25@1.30	1.30@1.35
Screenings	.95@1.00	.85@ .95	.85@ .95	.95@1.00	1 00

	Saline and Harrisburg	E. Kentucky	Pocah. and W. Va. Smokl.	Penn. Smokeless	Hocking
Lump	$2.00	$2.25@2.75	$2.25@2.50	$2.10@2.25	$2.00@2.25
1¼-in. lump	1.50@1.65	.....	.....	.....	1.80@1.90
Egg	2.00	1.85@2.15	2.25@2.50	2.10@2.25	2 00
Nut	2.00	1.60@2.15	1.70@2.00	1.70@2.00	.....
No. 1 nut	1.85@2.00	.....	.....	.....	.....
No. 2 nut	1.75@1.85	.....	.....	.....	.....
Mine-run	1.25@1.35	1.30@1.35	1.75@2.10	1.65@1.75	1.35
Screenings	.95@1.00	.....	.....	.....	.....

Some wholesalers have advanced anthracite prices 25c. per ton, and Chicago retailers have increased their prices 50c. per ton. A very small tonnage has been received this week, and the situation is reaching a point where many shippers will neither guarante price nor future delivery. Anthracite all-rail shipments are very slow in reaching Western points, and the dock supply of hard coal is said in some cases to be exhausted.

ST. LOUIS

Heaviest domestic demand in years due to shortage of Eastern coals. Better grades practically out of the market. No anthracite to be had.

The demand for domestic coal is stronger than it has been for years. The car supply is probably the greatest factor in this demand, although even eliminating the car-supply feature the demand would be wonderfully strong owing to the fact that nobody stored coal in the summer. In Chicago and the North there is a tremendous shortage of all high-grade Eastern coals and for the first time in years dealers are buying the medium grades of Illinois lump coal to put in on their apartment house and other steam contracts.

There is no relief in sight so far as the Eastern situation is concerned as operators throughout eastern Kentucky, Pennsylvania and West Virginia advise that they are completely sold up. Owing to the extreme car shortage in the East, shipments to Western markets are scarcely one-quarter of their usual volume. Western coals are already higher in price than they have been in years and when the full force of the demand hits them it is very hard to predict where the prices will land.

Franklin County is practically off the market as all of the operators are sold up for a month or two ahead on nearly all sizes and will not accept orders excepting based on the current price at time of shipment. They have nominally issued a quotation of $2 at the mines for October. It is universally thought that this price will go to $2.25 or $2.50, as the demand fully justifies it.

The entire Springfield district of Illinois is sold up, all grades of domestic coal bring from $1.75 to $2 per ton at the mines.

In Williamson County the same condition prevails.

In the Standard district the prices have been advanced all down the line from 20c. to 50c. per ton in the last ten days. There is very little free coal to be had in this district. As the Standard district has the largest surplus supply of any district in Illinois they will probably catch the overflow of orders from the other districts.

Two or three of the largest Western agents for anthracite coal advise that they could run without another order until the first of January. Not a single company is accepting any orders on anthracite coal. The dock companies advise that their entire tonnage is practically sold out and that as soon as the orders on hands are filled the docks will be bare.

The market is quotable on the following basis per net ton, f.o.b. mines:

	Franklin County	W'mson	Staun. and Mont.	Standard
6-in. lump	$2.00	$2.00	$1.75	$1.65
6x3-in. egg	2.00	2.00	1.75	1.50
3x2-in. nut	2.00	2.00	1.75	1.25
No. 2 nut	1.75	1.65	1.40	1.00
No. 3 nut	1.50	1.40	.....	.....
No. 4 nut	1.35	1.25	.....	.....
No. 5 nut	.75	.75	.....	.....
Screenings	.90	.85	.85	.80
2-in. lump	.....	.....	.....	.....
Steam egg	.....	.....	.....	.....
Mine-run	1.40	1.25	1.25	1.15
Washed	.....	.....	.....	.....
No. 1 nut	.....	2.00	1.75	1.65
No. 2 nut	.....	1.75	1.60	1.50
No. 3 nut	.....	1.40	1.30	1.25
No. 4 pea	.....	1.25	1.25	1.20
No. 5 slack	.....	.75	.75	.75

General Statistics

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the Pennsylvania Railroad Co.'s lines east of Pittsburgh and Erie for August and the eight months of 1915 and 1916, in short tons:

	August		Eight Months	
	1916	1915	1916	1915
Anthracite	1,001,198	743,257	7,767,748	6,811,293
Bituminous	4,292,627	3,847,575	32,576,476	27,703,075
Coke	1,173,884	1,135,645	9,682,236	7,222,840
Total	6,467,709	5,726,477	50,026,460	41,737,208

COAL AND COKE EXPORTS

Exports of domestic coal and coke from the United States and bunker coal laden on vessels engaged in the foreign trade, at the specified districts, during the month of July, 1916, were as follows:

Districts	Anth.	Bitum.	Coke
Me. & N. Hamp.	1,027	.....	13
Vermont	1,615	5,672	29
Massachusetts	309	81	.....
St. Lawrence	88,472	57,173	1,892
Rochester	79,978	144,112	425
Buffalo	164,167	140,139	27,336
New York	19,489	4,387	1,897
Philadelphia	3,722	70,133	2,910
Maryland	.....	100,084	2,483
Virginia	.....	536,979	1,507
S. Carolina	.....	8,866	2,114
Florida	.....	.....	33
Mobile	.....	2,070	.....
New Orleans	.....	3,408	145
Laredo	.....	1,475	847
El Paso	28	1,452	.....
Eagle Pass	.....	315	50
Arizona	.....	1,412	3,249
Southern Calif.	.....	171	.....
San Francisco	11	.....	10
Washington	.....	90	3,304
Alaska	.....	14	.....
Hawaii	.....	1	.....
Dakota	187	1,788	135
Dul. & Superior	.....	1,832	93
Michigan	.....	60,473	8,645
Ohio	31,073	889,891	260
Total	390,078	2,032,018	57,377

BUNKER COAL

Districts	Gross Tons
Maryland	49,478
New York	296,474
Philadelphia	37,303
Virginia	185,904

BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of July and August, 1916 and 1915:

	July		August	
	1916	1915	1916	1915
Coal	3,000,742	2,887,918	2,998,897	3,009,028
Coke	335,094	344,557	350,101	345,258
Total	3,335,836	3,232,475	3,348,998	3,354,286

Foreign Markets

GREAT BRITAIN

Sept. 13—The coal position remains about the same as last reported with a continued great scarcity of coal and consequent high values.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$11.28@11.52
Best dry coals	10.20@10.80
Best Monmouthshires	11.28@11.52
Seconds	10.56@10.80
Best Cardiff smalls	7.20@ 7.80
Cargo smalls	5.40@ 6.00

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The freight market continues in a sloppy and inactive state, with very little business passing.

Gibraltar	$6.24	Port Said	$13.80
Genoa	14.40	Las Palmas	6.60
Naples	14.40	St. Vincent	7.20
Alexandria	14.40	River Plate	7.50

Financial Department

Pond Creek Coal Co.

President Thomas B. Davis, of this company, reports for the year ending Dec. 31, 1915, as follows:

The production of coal for the year amounted to 753,798 tons, an increase of 63,145 tons over 1914. After payment of interest charges we had a deficit of $22,318, against a deficit of $19,456 for 1914. Conditions as of Dec. 31, 1914, were very unfavorable and they remained so up to the last quarter of this year. With the return of better conditions in the steel industry, however, the demand for coke has greatly improved, and prices for all grades of coals, including coking coals, are now on a satisfactory basis. We have not so far, however, been able to reap the advantages of the changed conditions on account of our still having on the books a number of contracts entered into at the time when prices were depressed.

The average price at which the company will sell its coal through 1916 will undoubtedly be very much better than it was last year, and this will naturally place the company in a position to earn a substantial profit. The production for the first quarter of 1916 was almost double that of the same period in 1915, so that the company is now earning a profit above its fixed charges. The outlook for the year 1916 is most excellent.

Additions to capital account amount to $40,218. No provision for depreciation has been made, but the mater is now under consideration.

BALANCE SHEET FEB. 29, 1916, AND FEB. 28, 1915

Assets—	1916	1915
Property *	$3,455,670	$3,416,951
Investments (cost)	56,500	56,500
Book debts	163,941	132,075
Stocks at stores	9,930	9,423
Mining supplies	22,936	18,809
Coal on hand	16,061	10,432
Cash	52,198	26,838
Unexpired insurance	3,780	4,803
Disc't on securities	159,137	149,526
Total	3,940,154	3,825,357
Liabilities—		
Common stock	$2,000,000	$2,000,000
Preferred stock	27,500	16,500
First mtge. bonds	1,634,000	1,595,000
Accounts payable	27,732	25,832
Accr'd bond interest	41,452	30,608
Depreciation reserve	63,784	38,949
Other reserves	47,607	36,800
Sinking Fund	32,723	28,014
Surplus	65,356	53,654
Total	3,940,154	3,825,357

* Property includes mining rights, development, electric-power plant, real estate, maritime railway and equipment. There is also a contingent liability on bills discounted, $32,181.

Note—For previous annual report of this company see Vol. 9, p. 404.

INCOME ACCOUNT FOR YEARS ENDING DECEMBER 31

	1915	1914		1915	1914
Gross earnings	$104,017	$104,137	Gross income	$97,682	$100,544
Net earnings	80,504	80,497	Bond interest	120,000	120,000
Other income	17,178	20,047	Balance, deficit	22,318	19,456

BALANCE SHEET DECEMBER 31

Assets	1915	1914	Liabilities	1915	1914
Real estate	$1,002,974	$997,145	Stock	*$2,000,000	$2,000,000
Construction, etc	1,740,073	1,702,802	Share premium acct	250,000	250,000
Equipment	502,963	505,846	1st M. conv. bonds	2,000,000	2,000,000
Investments	5,000	.....	Accounts payable	64,320	31,578
Cash	683,935	702,440	Accrued pay-roll	12,248	8,699
Prepaid insur., etc	9,697	18,485	Drafts in transit, etc	11,210	12,046
Accounts receivable	143,872	97,184	Funds and reserves	3,820	2,000
Inventories, etc	214,309	260,965			
Profit and loss, def	41,774	19,456			
Total	$4,344,598	$4,304,323	Total	$4,344,598	$4,304,323

* Includes capital stock authorized, $3,500,000 less $1,200,000 reserved for exchange of convertible bonds and $300,000 unissued.

Note—For previous annual report of this company see Vol. 8, p. 830.

Maritime C. Ry. & Power Co., Ltd.

This company reports for the fiscal year ended Feb. 29, 1916, as follows:

Results—The net profits, after providing for all administration and general charges, bad debts, depreciation on mining rights, etc., amounted to $136,193, an increase of $24,982 over 1914-15. Out of this amount there has been paid interest on bonds, $97,407; transferred to the sinking fund reserve account, $4,710; discount on securities account, written off, $8,841, and $13,534 credited to depreciation and renewal reserve account, leaving $11,701 credit to profit and loss account, which now stands at $65,356. Additional bonds were issued to the amount of $44,500 and $5,500 of bonds were redeemed by means of the sinking fund and canceled.

Coal Department—During the first half of the year demand for coal was light and prices generally were poor, but during the latter half of the year conditions improved considerably. Like most of the coal companies, however, we have suffered and are now suffering considerably through shortage of labor consequent upon the war, no less than one-third of our miners having already enlisted for overseas service. The necessary development work has been kept up during the year and there is coal now opened up, at the present rate of output, for at least two years to come.

PROFIT AND LOSS ACCOUNT

	1916	1915
Net profits	$136,193	$122,473
Discount, etc., written off	8,841	7,870
Depreciation	13,534	6,416
Miscellaneous	.....	9,846
Bond interest	97,407	93,602
Sinking fund	4,710	3,842
Balance, surplus	$11,701	$897

Mahoning Investment Co.

The company reports for fiscal year ending June 30, 1916, as follows:

INCOME ACCOUNT FOR YEARS ENDING JUNE 30

Receipts from	1915-16	1914-15
Jeff. Supply Co. divs. (6%)	$3,720	$3,720
Mah. Supp. Co. divs. (6%)	5,940	5,940
R. & P. C. & I. Co. divs.	.....	(1%) 39,995
Balance of interest	230	121
Total available	$9,890	$49,776
Deduct—Divs. paid	.....	(1%) 41,262
Gen. exp. and taxes	1,571	2,607
Balance, sur. or def.	sur. $8,319	sur. $5,907

BALANCE SHEET JUNE 30

Assets	1916	1915
Cost stock, etc	$4,134,000	$4,134,000
Bills receivable	200,000	200,000
Cap. stk. in treas	73,800	73,800
Cash	12,663	4,344
Total	4,420,463	4,412,144
Liabilities	1916	1915
Capital stock	$4,200,000	$4,200,000
Bills payable	200,000	200,000
Surplus	20,463	12,144
Total	$4,420,463	$4,412,144

"Cost of stock, etc., $4,134,000," includes cost of 39,995 shares of Rochester & Pittsburgh Coal & Iron Co. stock, and of $9,000 miscellaneous securities.

Regarding Rochester & Pittsburgh Coal and Iron Co., Secretary Lewis Iselin, Sept. 1, wrote:

"The sum of $174,002 was paid into the sinking funds out of earnings during the year; this amount, together with the interest on bonds already in the sinking fund, was used for the redemption of $116,000 par value of bonds of various issues, and for the purchase by the trustee under the mortgage of $73,000 4½% bonds. The original issue of these bonds was $2,000,000, of which the trustee now holds $548,000 in the sinking fund.

"The sum of $32,742 was expended for construction and equipment, to further develop the company's mining plants.

"The coal mined amounted to 2,719,219 tons, against 2,594,615 tons in 1914-15, and coke tonnage 211,970 tons, against 208,465.

"The operations at the mines were seriously curtailed in April, May and June on account of the negotiation of a new wage scale which went into effect as of Apr. 1, 1916. Except for the scarcity of labor, the company has good prospects of mining and disposing of a large tonnage from July 1.

"No dividends were paid since Aug. 1, 1914."

OPERATIONS FOR FISCAL YEARS ENDING JUNE 30

	1915-16	1914-15
Net earnings	$452,484	$372,743
Taxes	37,011	30,000
Int. on bonded debt	198,394	202,168
Bond redemp. and sink. fd	174,002	168,257
Profit or loss	prof. $43,076	loss $27,622
P. & L. surp. beg. of yr.	702,577	772,047
Total	$745,653	$744,425
Deduct		
Construction and equip't	.....	.....
Bad debts	Cr. $14	$1,848
Discount on bonds sold	.....	.....
Div. on $4,000,000 stock	.....	(1%) 40,000
Total deductions	Cr. $814	$41,848
P. & L. sur. end of year	$746,467	$702,577

Pocahontas Coal and Coke Co.

The annual report of the N. & W. Ry. for the year ended June 30, 1916, contains the following comments on the operations of this subsidiary company:

The sinking fund provided for in the Pocahontas Coal and Coke Co.'s purchase money first mortgage dated Dec. 2, 1901, amounted for the calendar year 1915 to $283,155.35. Through this and other sums received by the Trustee under the terms of the mortgage, bonds aggregating $316,000 were purchased and canceled. From the beginning of the operation of the sinking fund in 1906 to date, it has received from royalties on coal mined the sum of $2,206,575.65 and from sales of lands the sum of $134,716.22, a total of $2,341,291.87, by means of which there have been purchased and retired bonds to the aggregate amount of $2,593,000, reducing the outstanding bonds to $17,407,000, and leaving a cash balance of $101.32 in the sinking fund.

These bonds, known as Norfolk & Western-Pocahontas joint bonds, are a joint liability of the Norfolk & Western Railway Co. and the Pocahontas Coal & Coke Co. The accounting classification of the Inter-State Commerce Commission requires them to appear on the "liabilities" side of your company's balance sheet as a "joint liability," with an offsetting entry on the "assets" side as a "deferred asset" of a like amount.

The consolidation of the company's properties through the purchase of interior tracts and exchanges of lands with other owners, and the work of completing titles, surveying, monumenting and mapping continue. Your company has not been called upon to make further advances for these purposes, but has received from the Pocahontas Coal and Coke Co. $65,000 on account of advances previously made.

The profit and loss account of the Pocahontas Coal and Coke Co. for the year ending June 30, 1916, showed a surplus of $242,708.99 over sinking fund and funded debt interest requirements, as against a deficit in the previous year of $15,789.76. Payments aggregating $60,000 have been made on account of indebtedness incurred in previous years to meet fixed charges and further payments aggregating $120,000 will be made during July, 1916.